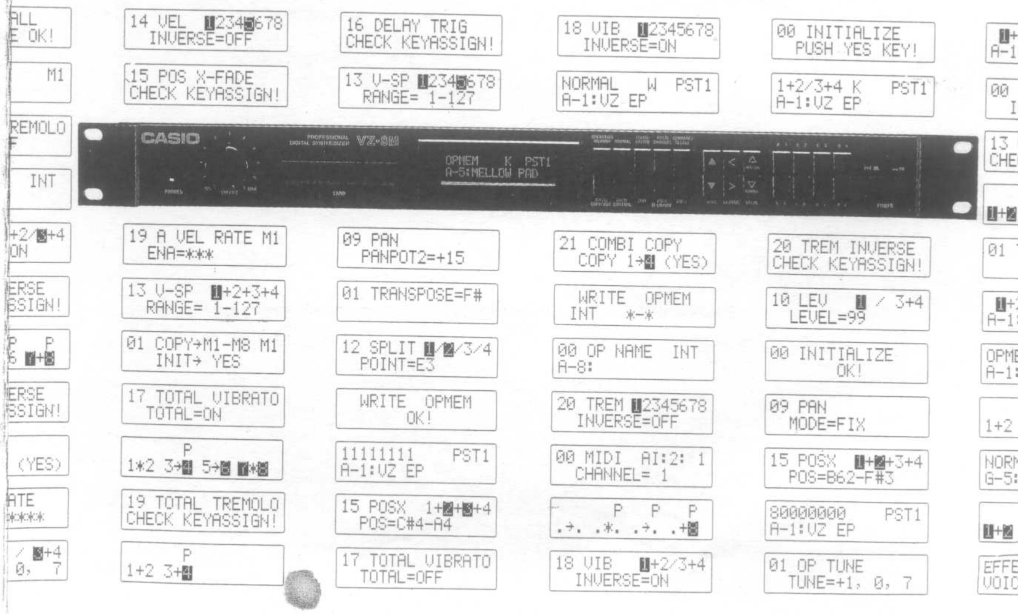
CASIO DIGITAL SYNTHESIZER VZ-8M CASIO.

CASIO DIGITAL SYNTHESIZER

OPERATION MANUAL 1
MANUAL DE OPERACION ··· 117

VZ-8M


14 VEL 12345678
INVERSE=OFF
15 POS X-FADE
CHECK KEYASSIGN!
16 DELAY TRIG
CHECK KEYASSIGN!
13 V-SP 12345678
RANGE= 1-127
18 VIB 12345678
INVERSE=ON
NORMAL W PST1
A-1:VZ EP
00 INITIALIZE
PUSH YES KEY!
1+2/3+4 K PST1
A-1:VZ EP
CASIO
PROFESSIONAL DIGITAL SYNTHESIZER VZ-8M
OPMEM K PST1
A-5:MELLOW PAD
19 A VEL RATE M1
ENA=***
13 V-SP 1+2+3+4
RANGE= 1-127
01 COPY→M1-M8 M1
INIT→ YES
17 TOTAL VIBRATO
TOTAL=ON
1*2 3→4 5→6 7*8
19 TOTAL TREMOLO
CHECK KEYASSIGN!
1+2 3+4
09 PAN
PANPOT2=+15
01 TRANSPOSE=F#
12 SPLIT 1/2/3/4
POINT=E3
WRITE OPMEM
OK!
11111111 PST1
A-1:VZ EP
15 POSX 1+2+3+4
POS=C#4-A4
17 TOTAL VIBRATO
TOTAL=OFF
21 COMBI COPY
COPY 1→4 (YES)
WRITE OPMEM
INT *-*
00 OP NAME INT
A-8:
20 TREM 12345678
INVERSE=OFF
00 MIDI AI:2: 1
CHANNEL= 1
18 VIB 1+2/3+4
INVERSE=ON
20 TREM INVERSE
CHECK KEYASSIGN!
10 LEV 1 / 3+4
LEVEL=99
00 INITIALIZE
OK!
09 PAN
MODE=FIX
15 POSX 1+2+3+4
POS=B62-F#3
80000000 PST1
A-1:VZ EP
01 OP TUNE
TUNE=+1, 0, 7

CASIO®

CASIO VZ-8M

DIGITAL SYNTHESIZER

Thank you for purchasing the Casio VZ-8M Digital Synthesizer Module. The VZ-8M is a highly innovative digital synthesizer which features Casio's newly-developed "iPD" (Interactive Phase Distortion) Modular Sound Source system. To obtain optimum performance and assure long-term reliability from your new VZ-8M, be sure to read this manual carefully and store it in a safe place so you can refer to it often.

Internal F0, 44, 03, XX, 7D, 51, , F7
Preset 1 F0, 44, 03, XX, 7D, 51, 20, F7
Preset 2 F0, 44, 03, XX, 7D, 51, 21, F7

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

"CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL."

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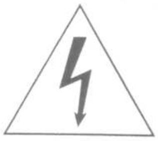


The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Main Features

1 Amazing Synthesis Versatility Thanks to Casio's All-new iPD Sound Source

Casio's all-new "Interactive Phase Distortion" (iPD) sound source system actually consists of 8 independent "modules" (M1 to M8). Each of these modules contains a DCO and a DCA, and is capable of generating independent waveforms. In the iPD system, the wave generated by any module can be used in either of two ways; to produce audible sounds or to modify waves generated by other modules.

The 8 iPD sound source modules work in associated pairs that are called "Internal Lines," or simply "lines." There are 4 internal lines — A, B, C and D.

The waveforms generated by both modules in any line can be used together in three different ways. They can be mixed, or one of the waveforms can be used to modulate the other for RING modulation or as the PHASE of a succeeding line.

2 Instant Recall of up to 320 Sounds and 320 Operation Memories

128 presets give you a wide range of vocal versatility. And with the use of an optional ROM card, the VZ-8M gives you incredible tonal expansion potential — up to 128 patches and 128 multi-patch setups are literally at your fingertips. What's more, you can store up to 64 sounds and 64 operation memories on on-board memory or an optional RAM card, for even greater freedom of timbral expression.

3 Player-selectable Keyboard, Guitar & Wind MIDI Performance Modes

The VZ-8M lets you select from 3 different MIDI performance modes, according to the type of MIDI controller you're using. Just select a sound and choose the performance mode — the "K" performance mode arranges sounds in full polyphony, for realistic keyboard performance. The "G" performance mode lets you play the same sound in mono, emulating the individual strings of a guitar, while the "W" performance mode provides the natural after-touch characteristics necessary for playing with wind controllers.

4 Multi-Channel MIDI Performance

The VZ-8M features Casio's exclusive multi-channel mode which can accept up to 8 timbres from separate MIDI sound sources. These can then be divided into constituent polyphonics and ensembled in any format you desire. Multi-timbral MIDI expansion, monophonic MIDI performance, or total 8-note MIDI polyphony can be selected.

5 Built-in Panning Function

The VZ-8M's built-in panning function lets you choose from three different panning effects; Fixed panning, Controlled panning and Auto panning. Each panning effect adds spacial realism and ambience to your sound.

6 "Player-friendly" Menus and Functions

Virtually all of the VZ-8M's editing and programming operations are organized into three basic menus — the VOICE PARAMETER menu, EFFECT menu and TOTAL CONTROL menu — that feature a variety of "functions." Each of these functions is further broken down into "parameters," which are constants that have changeable values or settings. To alter sounds or programming, you simply alter the value of these parameters using value keys.

7 Combination Mode Provides Layered and Split Voicing

The VZ-8M's "Combination" mode lets you mix together up to 8 different patches in any of 9 different patch mix or patch split configurations. (1+2, 3+4, 1+2+3+4, 1+2+3+4+5+6+7+8, 1/3, 1+2/3, 1/3+4, 1+2/3+4, 1/2/3/4) You can set effect and amp levels independently for each patch.

8 Velocity Split & Positional Cross Fade

The VZ-8M puts powerful multi-voice performance in your hands, with advanced features such as velocity split and positional cross fade. Set up multi-layered voices with up to 3 split points, and "fade" the voices into one another so there's no audible "split point" with the cross fade function, or control multiple voices through velocity message using velocity split.

9 Optional ROM & RAM Cards

Choose from optional ROM or RAM cards for expanded sound storage and recall capabilities. Each ROM card holds an impressive 128 patches and 128 different operation memories. With a RAM card, you can store up to 64 patches and 64 operation memories. What's more, VZ-8M patches can be used in a Casio PG series guitar synth.

Important Terms

Throughout this manual you will encounter terms (words) which you may — or may not — be familiar with. Before jumping into the operations, it's important to make sure that you understand the basic usage of these terms in this manual. Take a few moments to read through these words and become familiar with them — you'll find it will enhance your overall understanding of this unit.

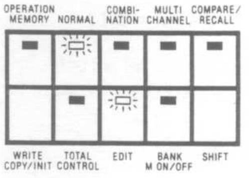
MENU	A displayed list of the various FUNCTIONS you can use to edit sounds. There are three basic Menus which can be selected; the VOICE PARAMETER menu (VOICE menu), EFFECT menu, and TOTAL CONTROL menu (TOTAL menu).
FUNCTION	Any of the items listed on the menus. Each Function contains a variety of PARAMETERS, and is identified by a two-digit number. For example, Function 02 in VOICE PARAMETER menu contains parameters related to detuning.
PARAMETER	A constant control which features variable levels. These parameters control not only data that affects the various components of a sound, but also aspects of the overall setup.
VALUE	The level or setting assigned to an individual parameter.
MODULE	The iPD sound source features 8 independent "modules." These can be thought of as independent — *but interrelated* — oscillators with controls.
INTERNAL LINE	Sound source MODULES work together in "pairs." These pairs form what is known as an INTERNAL LINE, or simply "line." For example, Module 1 and Module 2 (M1 and M2) form Internal Line A — known in this manual as LINE A. M3 and M4 form LINE B, etc.
EXTERNAL PHASE	In addition to using the output of any LINE to create audible sounds, you can utilize the output to modulate the succeeding line. For example, the output of LINE A can be used to modulate LINE B. This configuration is known as "External Phase." (Refer to "Theory: iPD Modular Sound System" for details.)
PATCH	With analog synthesizers, a "patch" literally referred to the way in which various synthesizer blocks or modules were hard-wired (hooked up). With digital synthesizers, this term has come to refer to completed sound data which can be output by the synthesizer. In this manual, you can think of "patch" as referring to **any completed sound data coming from modules 1 through 8.**
OPERATION MEMORY	An operation memory is literally a full "multi-timbral setup" or "performance setup", complete with specifications for multiple patches (when desired), keyboard and velocity split, MIDI settings, etc. The onboard memory allows storage of 128 preset operation memories.
ENVELOPE	A voltage which changes as a function of time. Envelopes are generally triggered by controllers, and are used to shape the amplitude (volume) and pitch of a note.
MODE	A particular operational function or condition. In "VZ language", there are 4 basic operational modes, including the NORMAL mode, the COMBINATION mode, the OPERATION MEMORY mode, and the MULTI CHANNEL mode. Each of these serves an independent purpose described later in this manual.

PERFORMANCE MODE	There are 3 basic "MIDI Performance Modes", which should not be confused with the basic operational "modes". The "Performance Modes" are actually preset parameter setups programmed for each sound individually, which can be selected to "match" the selected sound with the type of MIDI controller you are using. For example, if you're using a MIDI keyboard, you'll want to select the "K" or keyboard performance mode. In addition to "K", there are "G" (Guitar) and "W" (Wind) MIDI performance modes.
K MODE	Short for "**Keyboard** Mode" — one of three VZ-8M MIDI performance modes.
G MODE	Short for "**Guitar** Mode" — one of three VZ-8M MIDI performance modes.
W MODE	Short for "**Wind** Mode" — one of three VZ-8M MIDI performance modes.
VOICE-09	Throughout this text, the names of each of the three main "menus" is listed in capital letters. In this case, VOICE-09 indicates function "09" in the "Voice Parameter" menu — the "AMP ENV" function.
EFFECT-05	Throughout this text, the names of each of the three main "menus" is listed in capital letters. In this case, EFFECT-05 indicates function "05" in the "Effect" menu — the "DEF CONTROL" function.
CONTROL-04	Throughout this text, the names of each of the three main "menus" is listed in capital letters. In this case, CONTROL-04 indicates function "04" in the "Total Control" menu — the "MIDI CHANNEL" function.
OPE EFFECT	Indicates the EFFECT menu in the OPERATION MEMORY mode. For example, "OPE EFFECT-01" represents function "01" in the OPERATION MEMORY mode's EFFECT menu — the "OP TUNE" function.
PROG NO KEYS	Short for "Program Number Keys". These keys are used in a variety of sound synthesis and editing operations.
MOD WHEEL	Short for "Modulation Wheel".
DEF CONTROL	Short for "Definable Control".
PAGE KEYS	Used to "scroll" or advance up and down the selected VZ menu.
COMBI MODE	Short for "Combination Mode" — one of the 4 basic operational modes used in synthesis, editing and performance.
MULTI CH MODE	Short for "Multi Channel Mode" — another of the basic operational modes.
M ON/OFF KEY	Short for "Module ON/OFF Key" — keys used to turn the VZ's sound source modules ON and OFF.

Theory: Flow of Operations

Although the VZ-8M features a complex operating system, it has been designed so that actual operations are quite simple — after a few hours you'll be amazed at how simple the unit is to operate, and how versatile it is. In order to appreciate the beauty of the VZ, it's important to have a clear initial understanding of its basic "flow of operations" — in other words the basic order of operations you will probably want to follow to make the most of this synthesizer.

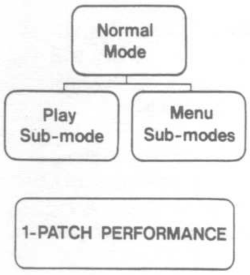
Simply speaking, operations can be divided into four different types — these correspond to the four basic operational "modes" — the **NORMAL** mode, the **COMBINATION** mode, the **OPERATION MEMORY** mode and the **MULTI CHANNEL** mode.


OPERATION MEMORY
NORMAL
COMBI-NATION
MULTI CHANNEL
COMPARE/ RECALL
WRITE COPY/INIT
TOTAL CONTROL
EDIT
BANK M ON/OFF
SHIFT

You can select any of these modes by pressing the corresponding key on the front panel. After selecting the MODE, you can select any of the editing modes. To select either the VOICE PARAMETER menu (VOICE menu) or EFFECT menu, press the EDIT key so that the key's LED indicator lights. To select the TOTAL CONTROL menu (TOTAL menu), simply press the TOTAL CONTROL key.
But before you start pressing keys, take a few moments to read through the following text. This should give you a clearer understanding of the relationship between the different basic modes.

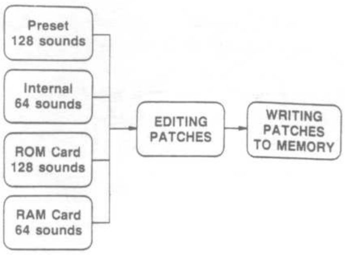
NORMAL MODE

The NORMAL mode is what you might think of if you've used a "normal" single-patch synthesizer that does not feature the extensive sound layering and memory capabilities of the VZ.


Normal Mode
Play Sub-mode
Menu Sub-modes
1-PATCH PERFORMANCE

The NORMAL mode can be further broken down into two sub-modes — the **PLAY** sub-mode and the **MENU** sub-mode. In other words, you can "play" or perform normally in this mode, or use any of the three editing MENUs to edit and create individual patches.
In the **PLAY** sub-mode, you can freely choose any of the sounds contained in the VZ's preset, internal or card-memories, and use it in performance. If you want to edit the sound, you simply select any of the editing MENUs which contain a wide range of "FUNCTIONs" for sound editing. Whenever you've selected any of the three editing MENUs, you're working in the "MENU" sub-mode.

The NORMAL mode is the basic performance mode, where "patches" created through the modular sound source system can be selected and output individually for 1-patch performance. You can make use of the wide range of the sound effects in this mode, for expanded performance versatility.


Preset 128 sounds
Internal 64 sounds
ROM Card 128 sounds
RAM Card 64 sounds
EDITING PATCHES
WRITING PATCHES TO MEMORY

You can also use the NORMAL mode to create new patches by altering values for existing patches and writing them in either the internal or card memory. Or create entirely new sounds by initializing a memory area and programming values.

Once you've created sounds you want to save, you can write them to one of 64 internal memory areas in the NORMAL mode, or to an optional RAM card which holds as many as 64 sounds.

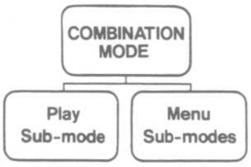
One important thing to remember when you select the NORMAL mode is that you're working with only **1 patch at a time** — you can recall one patch at a time, edit one patch at a time, perform with one patch at a time, and write an individual patch to memory.

NORMAL MODE

One patch at a time !

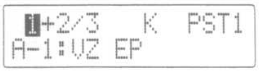
COMBINATION MODE

The COMBINATION mode is a **"buffer"** (for those with computer experience), or **"work area"** where you can "combine" the patches you've created in the NORMAL mode to make detailed, multi-timbral setups featuring keyboard split point, velocity split specifications, and individual effect specifications for each patch in the setup.



The COMBINATION mode can be further broken down into two **sub-modes** — the **PLAY** sub-mode and **MENU** sub-modes.

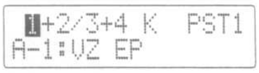
The PLAY sub-mode is selected for normal performance, while the MENU sub-modes are selected for further editing of sound, effect, and multi-timbral setup data.



```
1+2/3   K   PST1
A-1:VZ EP
```

In this work area, you can select up to 8 different patches created in the NORMAL mode (preset, or those you've created), and arrange them freely to create a multi-timbral setup. The "arrangement" of these sounds is accomplished by choosing from any of 9 different KEY ASSIGN settings, which feature both SPLIT and LAYERED patch arrangements (see "Performance/Editing in the Combination Mode").

A variety of the functions can be used to determine keyboard split points, as well as velocity split for each patch in the sound.



```
1+2/3+4 K   PST1
A-1:VZ EP
```

Effects can also be set individually for each patch in this mode. What's more, relative amplitude levels can be set for each patch, allowing total control of "balance" within the multi-patch sound.

This unit is designed so that you can quickly and conveniently arrange the patches you use in the multi-patch sound — if you don't like what you hear, you can choose a replacement patch or delete it from the sound altogether.

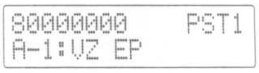
COMBINATION MODE

1 ~ 8 patches at a time!

One important thing to remember when you select the COMBINATION mode is that you're working with **up to 8 patches at a time.** Another important point is that the COMBINATION mode is only a "work area," where you can "work" on one "combined" (multi-patch) sound at a time.

MULTI CHANNEL MODE

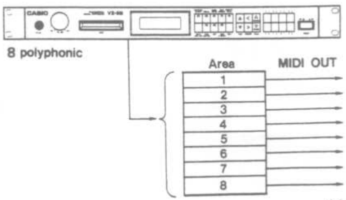
The **MULTI CHANNEL** mode is basically a performance mode, which makes advanced use of MIDI — the Musical Instrument Digital Interface.



```
80000000        PST1
A-1:VZ EP
```

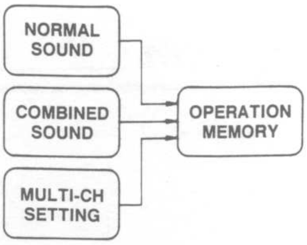
The VZ is capable or receiving MIDI performance messages two basic ways; (1) with 8-note polyphony wherein all notes and performance data transferred uses the same MIDI channel (MIDI mode 3 — omni OFF/poly), and (2) with 8-note polyphony, wherein each of the MIDI Multi Channel Areas (1 ~ 8) is assigned an individual timbre. In this status, each of the 8 areas is monophonic.

Each AREA can be assigned an independent sound, a polyphonic value (maximum number of note which may sound at one time for the specified area), output level, and the MIDI Receive channel number.

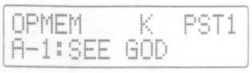


OPERATION MEMORY MODE

Once you've created a sound you want to save — whether it's an individual patch in the NORMAL mode, a combined sound in the COMBI mode or a MIDI setting in the MULTI CH mode — you can write it to one of 64 built-in Operation Memories.

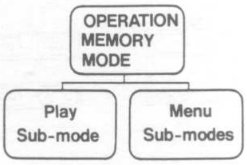

NORMAL SOUND
COMBINED SOUND
MULTI-CH SETTING
OPERATION MEMORY

The **OPERATION MEMORY** mode is used to memorize and recall not only the individual patches and combined sounds created in the first two modes and MIDI settings in the MULTI CH mode, it also holds sound-related details of effect and control panel settings. This is where you "store" the multi-patch setups and patches you've created, for instant recall during performance.


OPMEM K PST1
A-1:SEE GOD

This mode is actually used in concurrence with the NORMAL and COMBINATION and MULT CH modes, as it stores and recalls data which have been created in them.

The OPERATION MEMORY mode can be further broken down into **sub-modes** - the **PLAY** sub-mode and **MENU** sub-modes. The PLAY mode is selected for normal performance, while the MENU modes are selected for further editing of sound and effect data in the selected operation memory.

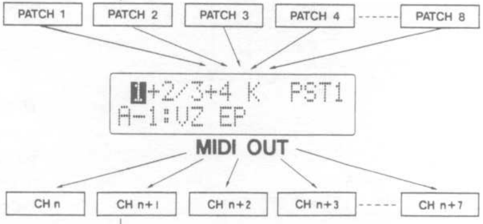

OPERATION MEMORY MODE
Play Sub-mode
Menu Sub-modes

Now that you understand the basic theory of VZ operations, the "BIG" picture becomes clearer;

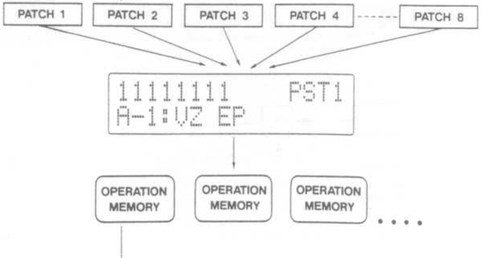
1 — Write, edit and recall individual patches using the **NORMAL** mode.

2 — "Combine" patches to make multi-timbral setups (combined sounds) in the **COMBINATION** mode.

3 — Create up to 8 MIDI "Multi Areas" in the **MULTI CHANNEL** mode.


PATCH 1
PATCH 2
PATCH 3
PATCH 4
PATCH 8
1+2/3+4 K PST1
A-1:VZ EP
MIDI OUT
CH n
CH n+1
CH n+2
CH n+3
CH n+7

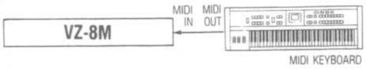
4 — Write patches, combined sounds and multi-channel MIDI settings to any of 64 operation memories and recall them for performance in the **OPERATION MEMORY** mode.

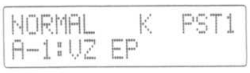

PATCH 1
PATCH 2
PATCH 3
PATCH 4
PATCH 8
11111111 PST1
A-1:VZ EP
OPERATION MEMORY
OPERATION MEMORY
OPERATION MEMORY

The MIDI "**Performance Modes**" are actually preset parameter setups, programmed for each sound individually, which can be selected to "match" the selected sound with the type of MIDI controller you are using. For example, if you're using a MIDI keyboard, you'll want to select the "K" or keyboard performance mode. In addition to "K", there are "G" (Guitar) and "W" (Wind) MIDI performance modes.

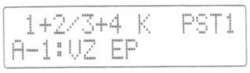
Keyboard Performance Mode — In the "K" or "Keyboard" performance mode, patches and multi-patch sounds are setup for MIDI polyphonic performance, matched to the performance capabilities and characteristics of MIDI keyboards.

[KEYBOARD MODE]





```
NORMAL    K  PST1
A-1:VZ EP
```

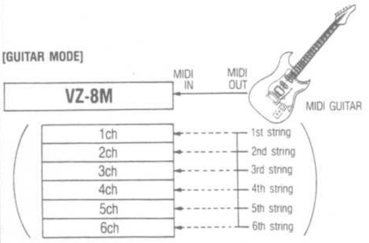


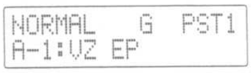
```
 1+2/3+4 K   PST1
A-1:VZ EP
```

Guitar Performance Mode — In the "G" or "Guitar" performance mode, patches and multi-patch sounds are setup for MIDI monophonic performance, matched to the performance capabilities and characteristics of MIDI Guitars, including Casio PG and MG series guitars. As each guitar string is assigned an individual MIDI channel, MIDI bend messages are received entirely independently for each string. In addition, string release sounds are more natural than with poly performance.

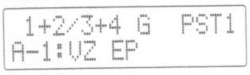
NOTE: When in "G" performance mode, the transmitting guitar should be set for MONO performance, allowing independent transmission of bend data for each string.

[GUITAR MODE]





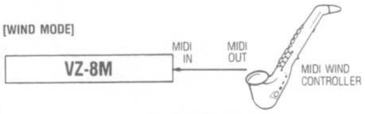
```
NORMAL    G  PST1
A-1:VZ EP
```

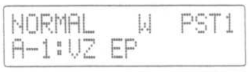


```
 1+2/3+4 G   PST1
A-1:VZ EP
```

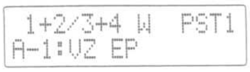
Wind Performance Mode — In the "W" or "Wind" performance mode, MIDI aftertouch data is automatically adapted to match the performance capabilities and characteristics of MIDI wind controllers. In both the "K" and "G" modes, MIDI data changes as shown in FIG-A. In the "W" mode, however, this same data changes as shown in FIG-B. This shows how the SENS parameter affects aftertouch characteristics when set between values of "0" and "91". The changes in these characteristics between values of "92" and "99" make it easier to perform using a wind controller, reproducing the delicate dynamic changes which are possible with wind instruments.

[WIND MODE]





```
NORMAL    W  PST1
A-1:VZ EP
```



```
 1+2/3+4 W   PST1
A-1:VZ EP
```

FIG-A

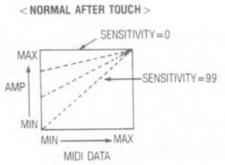
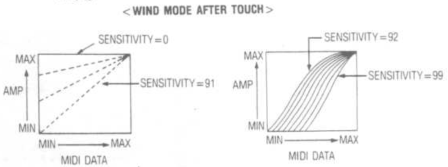


FIG-B



NOTE: When in "W" performance mode, the transmitting wind controller should be set so that after touch data can be used to affect volume.

Theory: iPD Modular Sound System

At the heart of the VZ's amazing sound synthesis capabilities is an all-new "iPD" (interactive Phase Distortion) sound source. In order to get the most out of your unit, it is vitally important that you understand at least the basic theory behind this new sound source.

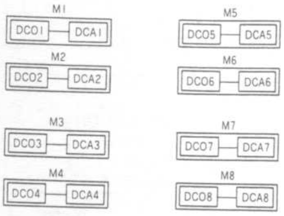
MODULES

The iPD sound source system actually consists of 8 independent **modules** (M1 to M8).

Each module contains a DCO and a DCA, and is capable of generating independent waveforms. (①) If you're familiar with analog synthesis, you can think of the modules as oscillators with controls. In the iPD system, the wave generated by any module can be used in either of two ways;

1 — to produce audible sounds
2 — to modify waves generated by other modules

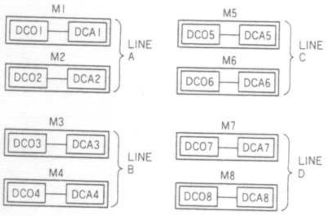
①


M1
DCO1
DCA1
M2
DCO2
DCA2
M3
DCO3
DCA3
M4
DCO4
DCA4
M5
DCO5
DCA5
M6
DCO6
DCA6
M7
DCO7
DCA7
M8
DCO8
DCA8

LINES

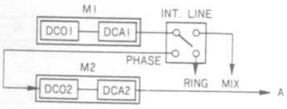
Generally speaking, the 8 sound source modules work in associated pairs that are called **"Internal Lines,"** or simply **"lines."** There are 4 internal lines — A, B, C and D, as shown to the right. (②)

②


M1
DCO1
DCA1
M2
DCO2
DCA2
LINE A
M3
DCO3
DCA3
M4
DCO4
DCA4
LINE B
M5
DCO5
DCA5
M6
DCO6
DCA6
LINE C
M7
DCO7
DCA7
M8
DCO8
DCA8
LINE D

The waveforms generated by both modules in any line can be used together in three different ways. The waveforms can be mixed, or one of the waveforms can be used to modulate the other for RING modulation or PHASE, as diagrammed at the right. (③)

③


M1
DCO1
DCA1
INT. LINE
PHASE
M2
DCO2
DCA2
RING
MIX
A

To show how the modules in each line are interrelated, let's analyze the relationship between the two modules which make up LINE A.

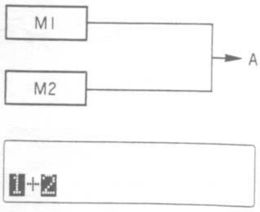
LINE A consists of two different modules — M1 and M2. While these modules are entirely independent and generate totally independent waveforms, they can be utilized together in any of three different output formats — **MIX** (mixed output), **RING** (ring modulation) and **PHASE** (phase).

MIXED WAVEFORM OUTPUT

When MIX is selected, the waveforms generated by M1 and M2 are output together, according to the formula given below. (④)

MIX: M1 + M2

④



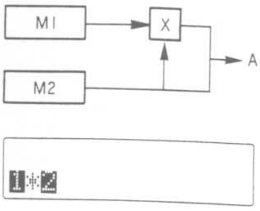
This may look a bit complex at first, but it's really not. It may be easiest to think of M1 and M2 as individual oscillators (which they are). In the MIX format, both of these oscillators sound together.

RING MODULATION

These same two waveforms can also be output using RING MODULATION, which is created according to the formula shown below. (⑤)

RING MOD: M2 + M2 × M1

⑤



You've probably heard ring modulation — even if you don't recognize the term. Typically, it creates a "clangorous" or metallic sound and is often used in synthesizing gongs, bells and other ringing percussive sounds.

PHASE

The 2 waveforms in LINE A (M1 and M2) can also be output using PHASE, according to the formula shown below. (⑥)

PHASE: M2(M1)

In this format, only one oscillator is heard, as one oscillator is used to modulate the other. In this case, M2 is produced using M1 as the phase to "read" the M2 waveform.

The degree of RING and PHASE effect is dependent on the amplifier (DCA) envelope of related modules. (In addition, to amp envelope, the degree of changes in sound (waveform) are affected by amp envelope-related parameters such as key Follow, Velocity, etc.) (⑦)

Naturally, these same functions and formulas apply to all 4 internal lines — LINE A, LINE B, LINE C and LINE D. And they can be used to modify the other Internal Lines through **External Phase** processing.

External Phase

When the External Phase format is selected, the line output of the two modules (M1 and M2 in our example) is used as the phase of the second module in the succeeding internal line — M4 in LINE B, in our example. (⑧)

Now that you have a basic grasp of how the system is organized, you can start to imagine just how versatile the VZ actually is. Because of the relationships between the sound source modules, you can create patches which contain independent sounds from each module, or use modules to modulate other modules. Theoretically, you can actually use modules 1 through 7 to modulate module 8, so that the only sound you actually hear is output through module 8!

To illustrate this more closely, take a look at the following examples.

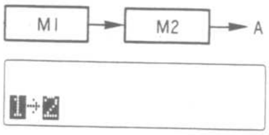
(EXAMPLE 1)

In this state the internal line of both LINEs A and B are set to MIX — i.e. the waveforms of both modules in each line are output "mixed" together, as shown on the display. (⑨) (⑩)
Before actually experimenting with the modular sound system, be sure to read through "Operating System Controls," the "Function Index Practice Exercise" and the "VOICE-00" function index. Note also that the illustration at the right is designed to help you understand the theory of the modular sound system, shows only M1 through M4, In actuality, it is possible to view M5 ~ M8 simultaneously with M1 ~ M4.

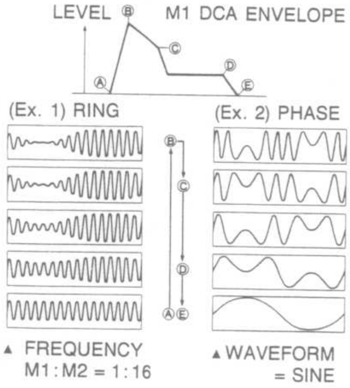
If, in this state, EXTERNAL PHASE from LINE A is specified, the display changes to that shown on the right, and the resulting waveform can be output from LINE A. (⑪)

Remember that LINEs which are used as external phase do not sound — they simply become the phase of the succeeding line. In our example, LINE A does not sound, but becomes the phase of LINE B.
Notice that the modules which are producing audible sounds appear highlighted on the display.

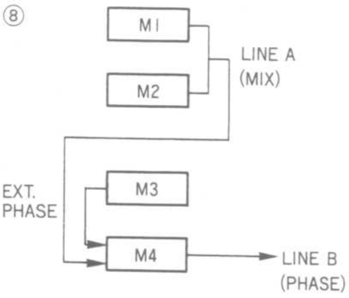
⑥

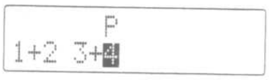


⑦ Diagram of relationship between DCA ENVELOPE and timbre.



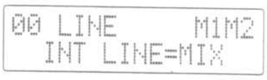
⑧





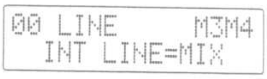
```
      P
1+2 3+4
```

⑨

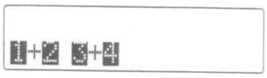


```
00 LINE      M1M2
  INT LINE=MIX
```

⑩

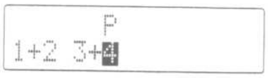


```
00 LINE      M3M4
  INT LINE=MIX
```



```
1+2 3+4
```

⑪

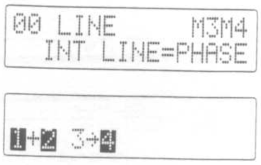


```
      P
1+2 3+4
```

(EXAMPLE 2)

In this state, the internal line of LINE A is set to MIX, while LINE B is set to PHASE — i.e. M3 becomes the phase of M4. (⑫)

⑫

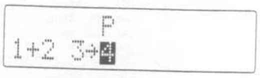


```
00 LINE         M3M4
  INT LINE=PHASE
```

```
1+2 3→4
```

If, in this state, EXTERNAL PHASE from LINE A is specified, the display changes to that shown on the right, and the resulting waveform can be output through LINE B. Once again, LINE A does not sound, but is used only as the phase of LINE B. (⑬)

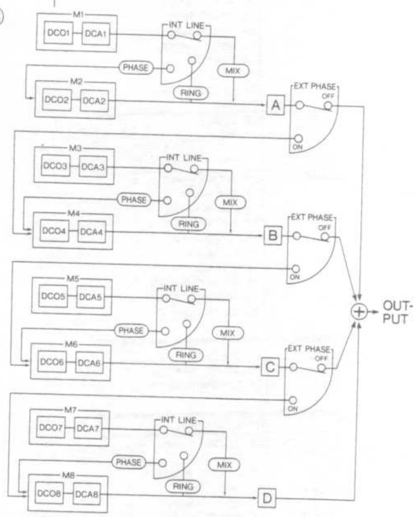
⑬



```
        P
1+2 3→4
```

With only one oscillator you can produce only one sound. But with 8 independent oscillators, you can create patches with varying degrees of complexity — using the oscillators together to create a "fat" layered patch consisting of sounds from all 8 modulators, or to create an individual sound output from a single oscillator with a "chain" of modulation stretching from M8 all the way back to M1. (⑭)

⑭


M1
DCO1
DCA1
INT LINE
PHASE
MIX
RING
M2
DCO2
DCA2
A
EXT PHASE
OFF
ON
M3
DCO3
DCA3
M4
DCO4
DCA4
B
M5
DCO5
DCA5
M6
DCO6
DCA6
C
M7
DCO7
DCA7
M8
DCO8
DCA8
D
OUT-PUT

The VZ lets you use all 8 modules entirely independently — using combinations of MIX, RING and PHASE output from each LINE to create a complex sonic matrix which is called a "patch". Once again, remember that a "patch" is simply the completed tone data coming from modules 1 through 8. Or, in simpler terms, an individual "sound" being output from the unit.

The number of possible combinations used to create a patch boggles the mind, when you consider the versatility of the control parameters which are used to shape the waveform being output from each module. (⑮)

⑮

MODULE	EXT PHASE	INT LINE	LINE A~D
M1 M2		MIX	A=M1+M2
		RING	A=M2+M1×M2
		PHASE	A=M2(M1)
M3 M4	OFF	MIX	B=M3+M4
		RING	B=M4+M3×M4
		PHASE	B=M4(M3)
	ON	MIX	B=M3+M4(A)
		RING	B=M4(A)+M3×M4(A)
		PHASE	B=M4(M3+A)
M5 M6	OFF	MIX	C=M5+M6
		RING	C=M6+M5×M6
		PHASE	C=M6(M5)
	ON	MIX	C=M5+M6(B)
		RING	C=M6(B)+M5×M6(B)
		PHASE	C=M6(M5+B)
M7 M8	OFF	MIX	D=M7+M8
		RING	D=M8+M7×M8
		PHASE	D=M8(M7)
	ON	MIX	D=M7+M8(C)
		RING	D=M8(C)+M7×M8(C)
		PHASE	D=M8(M7+C)

Operating System Controls

In some ways, your VZ is very similar to a computer, as it is capable of storing and generating a large amount of digital sound data. This "data processing" is maintained by the "Operating System," which you can think of as a collection of system programs that control the overall operation of the unit.

The main interface with the operating system can be found in the menu **functions**. These functions contain a number of **parameters,** which determine the various characteristics of the sounds. In fact, sound synthesis on the unit basically consists of inputting **values** for these parameters.

With a computer, you generally execute a certain program, and use a **cursor** to move to different positions in the displayed page, and use the keyboard to input commands, values, text, etc. (this is, of course a simplified explanation.)

Your unit works much in the same way, and it features a number of basic "Operating System Controls" which are used to perform the same functions a computer keyboard or mouse would perform.

Look at the MENUs shown to the right; this list gives you a bird's-eye view of how the MENUs, and FUNCTIONs within the menus, are organized. Notice that these menus are divided into sections, with the relative basic MODEs listed on the left, and the various FUNCTIONs on the right. The MODE side shows in which modes the various functions are operative.

VOICE PARAMETER		
NORMAL	DCO	00 LINE
		01 WAVE FORM
		02 DETUNE
		03 ENVELOPE
		04 ENV DEPTH
		05 KF LEVEL
		06 VEL LEVEL
		07 VIBRATO
		08 OCTAVE
	DCA	09 ENVELOPE
		10 ENV DEPTH
		11 KF LEVEL
		12 VEL LEVEL
		13 TREMOLO
		14 AMP SENS
		15 TOTAL LEVEL
	DCO/ DCA	16 KF RATE
		17 VEL RATE SENS
		18 PITCH VEL RATE
		19 AMP VEL RATE
		20 VOICE NAME
		21 INIT VOICE

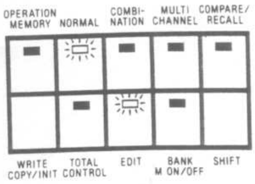
EFFECT	
NORMAL COMBI-NATION MULTI CHANNEL	00 MIDI CHANNEL
	01 PORTAMENTO/SOLO
	02 PITCH BEND
	03 AFTER TOUCH
	04 MOD WHEEL
	05 DEF CONTROL
	06 FOOT VR
	07 FOOT SW
	08 VEL TABLE SELECT
	09 PAN
COMBI-NATION MULTI CHANNEL	10 LEVEL
	11 PITCH
COMBI-NATION	12 SPLIT POINT
	13 VEL SPLIT
	14 VEL INVERSE
	15 POS CROSSFADE
	16 DELAY TRIG
	17 TOTAL VIBRATO
	18 VIBRATO INV
	19 TOTAL TREMOLO
	20 TREMOLO INV
	21 COMBI COPY

EFFECT	
OPERATION MEMORY	00 OPMEM NAME
	01 OPMEM TUNE

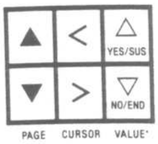
TOTAL CONTROL	
OPERATION MEMORY NORMAL COMBI-NATION MULTI CHANNEL	00 MASTER TUNE
	01 TRANSPOSE
	02 MEMORY PROTECT
	03 SAVE/LOAD
	04 MIDI CHANNEL
	05 MIDI DATA
	06 CARD FORMAT

To work in the operating system, you first choose what **MODE** you want to work in, by pressing one of the MODE keys.

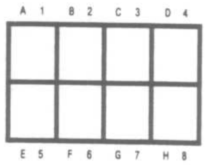
After you've selected the mode, you must specify what **MENU** you want to enter, by pressing EDIT key or TOTAL CONTROL key.



Now that you've specified the MODE and MENU, choose the actual FUNCTION containing the parameters you want to access by using the PAGE keys. You can scroll continuously through the functions in any selected menu with these keys. To scroll up (increment numbers), press the PAGE [▲] key. To scroll down (decrement numbers), press the PAGE [▼] key.

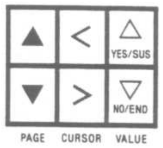


With some functions, you'll notice a module indicator (for example, "M2") at the top right-hand corner of the display. These indicators appear only when the selected function features a parameter which can be set for each sound source module individually. To select the module you want to edit, simply press the corresponding PROGRAM key (A1 ~ H8).


A 1
B 2
C 3
D 4
E 5
F 6
G 7
H 8

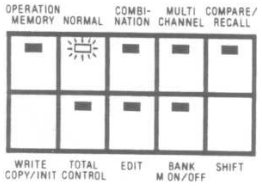
To alter the various PARAMETERS contained in any function, you use the CURSOR keys. These keys let you move up or down, and right or left in the lower section of the menu.

Once you've moved to a parameter which you want to set or edit with the cursor, you can use the VALUE keys to input values.


YES/SUS
NO/END
PAGE
CURSOR
VALUE

You can increment or decrement the value one step at a time by pressing the value keys. If you hold a value key down, the values increment or decrement automatically at high speed. When the lowest or highest value is reached, scrolling stops automatically.
(Note that this works with the "function" list in each of the three menus, as well, however scrolling continues in an endless loop as long as the key is held down.)

When you want to exit from any function, menu or mode, you can simply press any of the MODE keys, the EDIT key, or the TOTAL CONTROL key.
Notice that when you reselect a particular MENU , the function you last selected in that MENU is recalled. (Function "00" always selected in Operation Effect mode, however.)


OPERATION MEMORY
NORMAL
COMBI-NATION
MULTI CHANNEL
COMPARE/RECALL
WRITE COPY/INIT
TOTAL CONTROL
EDIT
BANK M ON/OFF
SHIFT

Difficult? Not at all! If it's not entirely clear, try going through the "Function Index Practice Exercise". This will familiarize you with the "Operating System Controls" — the VZ controls which are used to "communicate" with your VZ's operating system.

Menus and Functions

Within each Menu you will find a number of "Functions." Each of these functions is further broken down into "parameters," which are constants that have changeable values or settings.

For example, in VOICE menu, you can select from a variety of functions which affect the characteristics of the sound produced by each individual module (oscillator). To alter the characteristics of the sound, you simply alter the values of the various parameters contained in each VOICE menu function.

VOICE PARAMETER		
NORMAL	DCO	00 LINE
		01 WAVE FORM
		02 DETUNE
		03 ENVELOPE
		04 ENV DEPTH
		05 KF LEVEL
		06 VEL LEVEL
		07 VIBRATO
		08 OCTAVE
	DCA	09 ENVELOPE
		10 ENV DEPTH
		11 KF LEVEL
		12 VEL LEVEL
		13 TREMOLO
		14 AMP SENS
		15 TOTAL LEVEL
	DCO/DCA	16 KF RATE
		17 VEL RATE SENS
		18 PITCH VEL RATE
		19 AMP VEL RATE
		20 VOICE NAME
		21 INIT VOICE

When the EFFECT menu is chosen, you can select from a variety of functions which control built-in "sound effects". These can be used in the NORMAL, COMBI, and MULTI CH modes. In addition, 2 functions from the OPE EFFECT menu are used to make settings for Operation Memories in the OPERATION MEMORY mode.

EFFECT	
NORMAL COMBINATION MULTI CHANNEL	00 MIDI CHANNEL
	01 PORTAMENTO/SOLO
	02 PITCH BEND
	03 AFTER TOUCH
	04 MOD WHEEL
	05 DEF CONTROL
	06 FOOT VR
	07 FOOT SW
	08 VEL TABLE SELECT
	09 PAN
COMBINATION MULTI CHANNEL	10 LEVEL
	11 PITCH
COMBINATION	12 SPLIT POINT
	13 VEL SPLIT
	14 VEL INVERSE
	15 POS CROSSFADE
	16 DELAY TRIG
	17 TOTAL VIBRATO
	18 VIBRATO INV
	19 TOTAL TREMOLO
	20 TREMOLO INV
	21 COMBI COPY

EFFECT	
OPERATION MEMORY	00 OPMEM NAME
	01 OPMEM TUNE

When the TOTAL CONTROL menu is chosen, you can select from functions which provide "overall" control over the VZ-8M's performance. They include such parameters as tuning, MIDI settings, etc.

TOTAL CONTROL	
OPERATION MEMORY NORMAL COMBINATION MULTI CHANNEL	00 MASTER TUNE
	01 TRANSPOSE
	02 MEMORY PROTECT
	03 SAVE/LOAD
	04 MIDI CHANNEL
	05 MIDI DATA
	06 CARD FORMAT

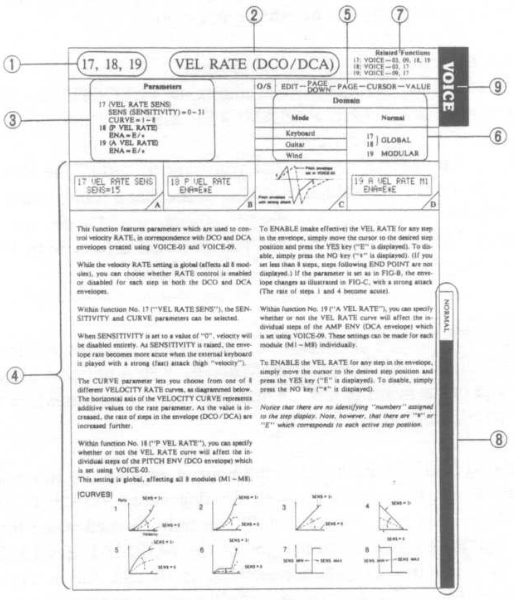
Take a look at the MENUs, this "menu hierarchy" gives you a clear view of how MENUs and FUNCTIONs are organized.

VOICE (PARAMETER) menu — SOUND EDITING FUNCTIONS
EFFECT menu — EFFECT-RELATED FUNCTIONS
TOTAL CONTROL menu — TOTAL CONTROL FUNCTIONS

It's important to remember that not all FUNCTIONs can be accessed in every MODE — notice that the menus are divided into sections, with the relative MODEs listed on the left. Remember that when you choose a particular function, the related operational mode must first be specified. You'll also notice that each FUNCTION INDEX lists the operational modes in which the function operates.

About Function Indexes

In the following section, you will find information on each "function" for all three menus. The function "indexes" listed on the following pages contain a variety of important information on the function and its parameters, as shown below;



17, 18, 19 VEL RATE (DCO/DCA)

Related Functions
17; VOICE—03, 09, 18, 19
18; VOICE—03, 17
19; VOICE—09, 17

O/S EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

Parameters
17 (VEL RATE SENS)
SENS (SENSITIVITY) = 0 – 31
CURVE = 1 – 8
18 (P VEL RATE)
ENA = E/∗
19 (A VEL RATE)
ENA = E/∗

Domain

Mode	Normal
Keyboard	17, 18 GLOBAL
Guitar	
Wind	19 MODULAR

```
17 VEL RATE SENS
  SENS=15
```

```
18 P VEL RATE
  ENA=E∗E
```

```
19 A VEL RATE M1
  ENA=E∗E
```

This function features parameters which are used to control velocity RATE, in correspondence with DCO and DCA envelopes created using VOICE-03 and VOICE-09.

While the velocity RATE setting is global (affects all 8 modules), you can choose whether RATE control is enabled or disabled for each step in both the DCO and DCA envelopes.

Within function No. 17 ("VEL RATE SENS"), the SENSITIVITY and CURVE parameters can be selected.

When SENSITIVITY is set to a value of "0", velocity will be disabled entirely. As SENSITIVITY is raised, the envelope rate becomes more acute when the external keyboard is played with a strong (fast) attack (high "velocity").

The CURVE parameter lets you choose from one of 8 different VELOCITY RATE curves, as diagrammed below. The horizontal axis of the VELOCITY CURVE represents additive values to the rate parameter. As the value is increased, the rate of steps in the envelope (DCO/DCA) are increased further.

Within function No. 18 ("P VEL RATE"), you can specify whether or not the VEL RATE curve will affect the individual steps of the PITCH ENV (DCO envelope) which is set using VOICE-03.
This setting is global, affecting all 8 modules (M1 – M8).

To ENABLE (make effective) the VEL RATE for any step in the envelope, simply move the cursor to the desired step position and press the YES key ("E" is displayed). To disable, simply press the NO key ("∗" is displayed). (If you set less than 8 steps, steps following END POINT are not displayed.) If the parameter is set as in FIG-B, the envelope changes as illustrated in FIG-C, with a strong attack (The rate of steps 1 and 4 become acute).

Within function No. 19 ("A VEL RATE"), you can specify whether or not the VEL RATE curve will affect the individual steps of the AMP ENV (DCA envelope) which is set using VOICE-09. These settings can be made for each module (M1 – M8) individually.

To ENABLE the VEL RATE for any step in the envelope, simply move the cursor to the desired step position and press the YES key ("E" is displayed). To disable, simply press the NO key ("∗" is displayed).

Notice that there are no identifying "numbers" assigned to the step display. Note, however, that there are "∗" or "E" which corresponds to each active step position.

[CURVES]
1 2 3 4
5 6 7 8

①Function Number

This number corresponds to the number of the function on the menu table on the preceding page.

②Function Name

This name corresponds to the name of the function as it is listed the menu table on the preceding page.

③Individual parameters and value range

This list shows all the parameters contained in the selected Function, as well as the range of values or settings which can be made for each parameter. For example, the SENSITIVITY parameter in the VELOCITY RATE function can be set at any level between 0 and 31.

④Explanation of function/parameters

This text provides a brief explanation of the purpose of the function, as well as its individual parameters.

⑤O/S (Operating System) control operation

Indicates the basic keys and controls used to select the function and move through the display hierarchy to edit settings for each parameter.

⑥Domain

GLOBAL — In some functions, settings are "Global," which means the settings effect the entire operating system, and all the sounds in it.

Reception in the COMBI mode is limited to KEY ASSIGN 1 data.

Reception in the "G" performance mode is limited to the primary channel set in EFFECT-00.

MODULAR — In some functions, settings can be made for each iPD module individually. In this case, the setting is said to be "modular."

LINE — In other functions, settings are made for each module "LINE" (remember, this is a set of modules — M1M2, for example).

PATCH — In the COMBI mode, some parameters affect each patch independently. In this case, the patch presently being edited is shown highlighted on the display. You can select a patch to edit with the PROG NO keys.

8-PATCH MIX GLOBAL — When an 8-patch mix is used in the COMBI mode, some parameters affect all 8 patches globally.

8-PATCH MIX COUPLE — When an 8-patch mix is used in the COMBI mode, certain parameters affect the patches in "couples". In this case, settings made for patch 1, for example, will also affect patch 5. The couple assignments are; 1↔5, 2↔6, 3↔7, 4↔8. Note that both patches in each "couple" are highlighted on the display when either is selected.

AREA — When parameters are displayed along with the Area number in the MULTI CH mode, the data affects each area independently. You can select an area to edit with the PROG NO keys.

⑦Related Functions

Lists the other editing functions that are closely interrelated with the selected function. In this case, the P VEL RATE (VOICE-18) function is closely related to such functions as VOICE-17 (the VEL RATE SENSITIVITY function), and VOICE-09 (the DCA ENVELOPE function).

⑧Modes

Lists all of the "operational modes" — NORMAL, COMBINATION, etc. — in which the function operates. (See the menu table on the preceding page. The left-hand column of the menu hierarchy shows the MODEs related to the FUNCTIONs on the right.)

⑨Menu

This "tab" at the edge of the page shows which "menu" the function can be accessed in. In this case, "VOICE" indicates that the VELOCITY RATE SENSITIVITY function can be accessed in the VOICE PARAMETER menu.

REMEMBER....

These indexes provide only basic information on each function and parameter. Many of these functions and parameters are interrelated, and it would take literally volumes to provide a technical explanation of how they actually affect the sounds. To gain a practical understanding, be sure to go through the PRACTICE EXERCISE found on the next page.

Function Index Practice Exercise

About the Function Index Practice Exercise

The following is an example of how you can use the Function Indexes as a guide to actual editing operations. Be sure to go through this exercise carefully, executing the operations as you go. This will not only provide you with an understanding of how you can utilize the indexes, but also a basic understanding of the editing operations.

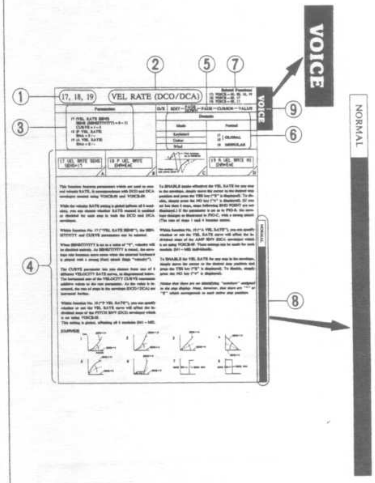
Practice Exercise: Using Function Indexes

How to use Function Indexes when editing the VELOCITY RATE-related parameters in the VOICE PARAMETER menu.

For this example, let's assume that you want to "edit" the VELOCITY RATE for the DCA envelope. Looking at the menu table, you'll find the VEL RATE SENS function listed as function 17 on the VOICE PARAMETER menu. Notice that this function affects both DCO and DCA envelopes, as shown in the second column.

VOICE PARAMETER		
NORMAL	DCO	00 LINE
		01 WAVE FORM
		02 DETUNE
		03 ENVELOPE
		04 ENV DEPTH
		05 KF LEVEL
		06 VEL LEVEL
		07 VIBRATO
		08 OCTAVE
	DCA	09 ENVELOPE
		10 ENV DEPTH
		11 KF LEVEL
		12 VEL LEVEL
		13 TREMOLO
		14 AMP SENS
		15 TOTAL LEVEL
	DCO/ DCA	16 KF RATE
		17 VEL RATE SENS
		18 PITCH VEL RATE
		19 AMP VEL RATE
		20 VOICE NAME
		21 INIT VOICE

The Function Indexes are arranged in three main sections in this manual, corresponding to the three editing MENUs. You'll notice a black "tab" at the edge of the page (item ⑨ on opposite page) which lists which "menu" the function can be accessed in.



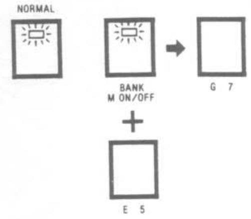
The related MODEs are listed at the bottom edge of the function index page (item ⑧ on opposite page). In this case, VOICE-17 (VOICE PARAMETER menu, function #17) can only be used when the NORMAL operating mode is selected (when the NORMAL key LED is lit). Since the goal of our practice exercise is to edit the RATE-related parameters for the DCA envelope, you'll want to choose a patch to edit which is audibly "dependent" on these settings. This will make it easier to actually hear how changes in the various parameters will influence the sound.

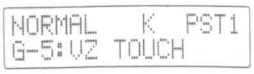
Try choosing PRESET (1) patch number G-5 — "VZ TOUCH."

- To do this first select the PRESET (1) area by pressing the SHIFT key.
- Next, press the BANK key followed by the "G" program key (labelled "G7"), and then the "5" key (labelled E5).

Now, play some notes with varying degrees of key velocity, and take note of how velocity affects this sound. Once you've got it down, go on to procedure 1 listed below.

1 For this example, we'll work in the NORMAL mode, so first press the NORMAL key.





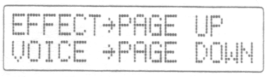
NORMAL K PST1
G-5:VZ TOUCH

Take a look at item ⑤ on the function index. This lists the Operating System controls that are used in editing the parameters contained in this function. You'll find this handy when working in any function. (Be sure to refer to this list as you work through this exercise as well.)

⑤

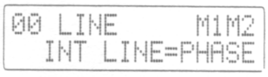
O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

2 Next, specify that you want to work in the VOICE menu sub-mode by pressing the EDIT key and the pressing PAGE DOWN key.



```
EFFECT→PAGE UP
VOICE →PAGE DOWN
```

If you've previously worked in the VOICE menu sub-mode, the function you selected last will automatically be recalled at this point. For our example, let's assume you last worked in VOICE-00 (LINE).



```
00 LINE        M1M2
  INT LINE=PHASE
```

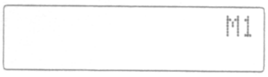
In this state, you can select function number with the PAGE keys.

Now take a look at item ⑥ in the VELOCITY RATE SENS Function Index. You'll notice that the "Domain" is listed as being "Global." This means that settings made in this function affect all sounds (as opposed to affecting only a single module, single line, etc.).

⑥

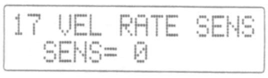
Domain	
Mode	**Normal**
Keyboard	17 } GLOBAL 18 } GLOBAL
Guitar	
Wind	19 MODULAR

Many functions feature a "modular" domain. In these cases, a MODULE number will appear at the right of the display. This indicates the module that is presently selected ("M1" for example) — and any settings that are made will affect only this module. You can select a different module by pressing any PROG NO key.



```
                 M1
```

3 Use the PAGE keys to select VOICE-17 (VEL RATE SENS).



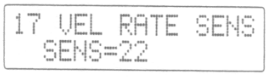
```
17 VEL RATE SENS
  SENS= 0
```

Look at item ③ in the index. Here are listed all the parameters contained in each function, as well as related information such as the range in which values can be set. You'll find this comes in handy in VZ-8M editing, as you can look up individual parameters easily without actually accessing a function (Note that VOICE menu functions 17 through 19 are all listed on the same index.)

③

Parameters
17 〈VEL RATE SENS〉 SENS (SENSITIVITY) = 0 ~ 31 CURVE = 1 ~ 8 18 〈P VEL RATE〉 ENA = E / * 19 〈A VEL RATE〉 ENA = E / *

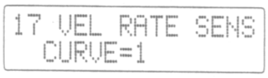
4 Try changing the SENSITIVITY parameter value by using the VALUE keys. As shown in the Function Index, this parameter can be set between "0" and "31." Set it to a value of about "22."



```
17 VEL RATE SENS
  SENS=22
```

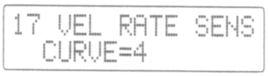
When SENSITIVITY is set to a value of "0", velocity will be disabled entirely. As SENSITIVITY is raised, the envelope rate becomes more acute when the controller is played with a strong (fast) attack (high "velocity").

The CURVE parameter lets you choose from one of 8 different VELOCITY RATE curves, as shown on the function index.



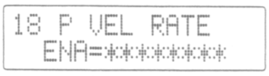
```
17 VEL RATE SENS
  CURVE=1
```

Try changing the CURVE parameter value by using the cursor key and the VALUE keys. Set it at a value of "4".



```
17 VEL RATE SENS
  CURVE=4
```

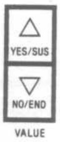
5 Press the PAGE [▲] key once again, and select VOICE-18 (P VEL RATE).



```
18 P VEL RATE
  ENA=********
```

Using the next function (VOICE-18, listed on the same index), you can specify whether or not the VEL RATE curve will affect the individual steps of the PITCH ENV (DCO envelope). This setting is global, affecting all 8 modules (M1 ~ M8). Note that the PITCH envelope is set using VOICE-03.

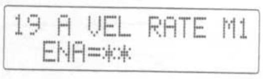
To ENABLE (make effective) the VEL RATE settings for any particular step in the DCO envelope, simply move the cursor to the desired step position and press the YES key.



Step numbers 1 through 8 are displayed from left to right.

To DISABLE the settings, simply press the NO key.
For our example, however, skip this function (VOICE-18) and go to VOICE-19 (remember, our goal is to alter only **DCA**-related settings...).

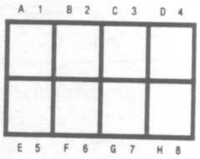
Using VOICE-19 "AMP ENVELOPE" function, you can specify whether or not the VEL RATE curve will affect the individual steps of the AMP ENV (DCA envelope) which is set using VOICE-09. Note that here, however, only 2 steps have been set, so only 2 are displayed.



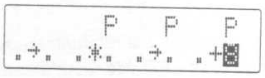
```
19 A VEL RATE M1
  ENA=**
```

Notice that these settings can be made for each module (M1 - M8) individually, as indicated by the module number which appears at the upper right-hand corner of the display.

You can select any module with the PROG NO keys.

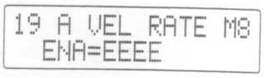


For our example, try selecting MODULE 8 by pressing the corresponding PROG NO key. To turn OFF all other modules, press the M ON/OFF key (BANK key) followed by the PROG NO keys A1 through G7, leaving only H8 on. In this way, you can focus on the DCA envelope for this individual module while editing, as others will not affect the sound.



6 To ENABLE the VEL RATE for any step in the DCA envelope of the selected module (M8), turn OFF the M ON/OFF key and simply move the cursor to the desired step position and press the YES key. To disable, simply press the NO key.

For our example, try enabling the VEL RATE for all 4 active steps in the envelope. Notice that there are no identifying "numbers" assigned to the step display. Note, however, that there are asterisks ("*") which correspond to each active step position (4, in this case). When a step is enabled, an "E" replaces the asterisk.



```
19 A VEL RATE M8
  ENA=EEEE
```

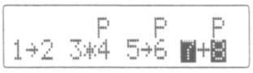
Now, play a few notes and chords again. Notice how the changes in the RATE curve and sensitivity have affected the sound.

Next, take a look at item ⑦ in the function index. This section lists the functions which are closely related to the VELOCITY RATE function. In this case, both the DCO ENVELOPE (VOICE-03) and DCA ENVELOPE (VOICE-09) are listed. Naturally, the settings of these envelope functions will affect the VELOCITY RATE function, and vice-versa.

⑦

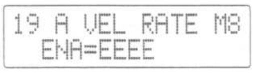
Related Functions
17; VOICE—03, 09, 18, 19
18; VOICE—03, 17
19; VOICE—09, 17

7 Next, to turn ON all 8 modules, press the M ON/OFF key followed by the PROG NO keys and ENABLE the curve and sensitivity for all steps in each module's AMP envelope.


```
    P    P    P
1→2 3*4 5→6 7+8
```

Again, play a few notes and chords and observe the changes in the overall sound.

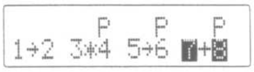
If you want to hear the "original sound" (the sound as it was before you edited), press the COMPARE/RECALL key. When the indicator is flashing, the original sound can be played. Press it once again to return to the edited version.


```
19 A VEL RATE M8
  ENA=EEEE
```

8 Since the domain of the settings made using these parameters is "modular" (settings made for each module independently), you may want to have a look at how the iPD modules are organized for this particular sound. This modular LINE configuration has a direct impact on the selected patch's sound, and you may often want to look at the line configuration when making editing decisions.

To access the LINE configuration when making modular parameter settings, simply press the M ON/OFF (BANK) key.

BANK
M ON/OFF

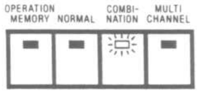

```
    P    P    P
1→2 3*4 5→6 7+8
```

Depending on how the INTERNAL LINE and EXTERNAL LINE settings are made in using the iPD sound source LINE function (VOICE-00), various symbols appear on the display. For example, "→" indicates PHASE, "*" indicates RING, "+" indicates MIX and "P" indicates EXT PHASE. The numbers corresponding to the modules which actually sound appear highlighted on the display. (For details, refer to "Theory: iPD Modular Sound System" in this manual.)

9 For this example, assume that you've now finished editing and you want to move immediately to performance in the OPERATION MEMORY mode. To do so, simply press the **OPERATION MEMORY** key.

OPERATION
MEMORY

To exit to another mode, simply press the MODE key.



10 Now assume that you want to go back and edit this same function again (for some reason). To do so, simply press the NORMAL key followed by the EDIT key and PAGE DOWN key.

The last-selected FUNCTION in each menu (with the execution of the 2 functions in the OPE EFFECT menu) is held in memory and instantly recalled. Note that function VOICE-19 (VEL RATE AMP) is recalled as soon as you press the EDIT key followed by the PAGE [▼] key.

Although this example only covers a single function, the basic operations are the same for all functions. If you have any difficulties when working in another function, be sure to refer back to this example.

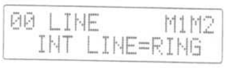
00 LINE

Related Functions

Parameters	**O/S**	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
INT LINE=MIX/RING/PHASE EXT PHASE=ON/OFF (for M3~M8)		

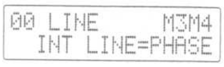
Domain

Mode	**Normal**
Keyboard	LINE
Guitar	
Wind	



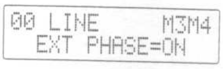
```
00 LINE       M1M2
  INT LINE=RING
```

A



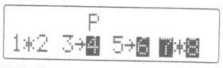
```
00 LINE       M3M4
  INT LINE=PHASE
```

B



```
00 LINE       M3M4
  EXT PHASE=ON
```

C



```
        P
1*2 3→4 5→6 7*8
```

D

Use this function to specify the line configuration for all four Internal Lines, as well as External Phase relationships. The INT LINE parameter lets you choose from MIX, RING, or PHASE settings, which determines how the waveforms produced by each module are output. Note that a diagram on the display shows the internal line configuration in modular form (FIG-A).

When you want to view another line, press a PROG NO key (C3~H8) of either module in the particular line you want to view (for example, to view the next line, press either the M3 or M4 selector).

In addition, this function features a "toggle" which lets you turn the EXTERNAL PHASE function ON or OFF for modules M3-M8. You can access this function by pressing the cursor key.

When EXTERNAL PHASE is ON, the second module in the specified LINE is modulated by the previous LINE (FIG-C).

To view the overall line configuration, press the M ON/OFF (BANK) key. As shown in FIG-D, LINEs used as EXT PHASE as designated by a "P" symbol on the display. For example, notice that M1M2 is used as the EXT PHASE of line M3M4. Also, note that "+" indicates MIX, "*" indicates RING modulation, and "→" indicates PHASE.
The modules which are actually producing audible sounds are highlighted on the display.

(For more information on the modular sound source system, refer to "Theory: iPD Modular Sound System".)

Note that when this function is initialized, data for all 8 modules are reset to factory settings (mixed internal line).

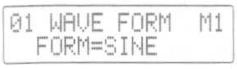
01 WAVEFORM

Related Functions

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
FORM = SINE / SAW1 / SAW2 / SAW3 / SAW4 / SAW5 / NOISE1 / NOISE2		

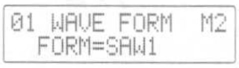
Domain

Mode	Normal
Keyboard	MODULAR
Guitar	
Wind	



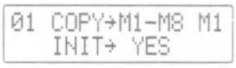
```
01 WAVE FORM  M1
  FORM=SINE
```

A



```
01 WAVE FORM  M2
  FORM=SAW1
```

B



```
01 COPY→M1-M8 M1
  INIT→ YES
```

C

With this function, you can choose the basic waveforms which are produced by each module. Waveforms determine the basic timbre — one of the three basic elements of any sound (pitch, timbre and volume). You can choose from 8 basic waveforms. (See information below for details on various types of waveforms.)

Note that waveforms can be selected for each module independently.

COPY/INITIALIZE

This function features COPY and INTIIALIZE functions which allow you to "copy" waveform specifications from one module to another, and to "initialize" the selected module to a SINE wave.

To COPY the waveform of the selected module to another module, first select VOICE-01 and the module containing the waveform you want to copy from. Next, hold down the WRITE key (FIG-C) and then press the PROG NO key corresponding to the module you want to copy into.

To INTIALIZE the selected module, first select VOICE-01 and the module containing the waveform you want to initialize. Next, hold down the WRITE key and then press the YES key. A SINE wave (initialized setting) will be selected for the FORM parameter.

About Waveforms

You can choose from 8 different waveforms.

These waveforms have the following types of characteristics.

Sine – the purest waveform possible with only the fundamental frequency and no other harmonics present. A "pure" whistling type of sound.

Saw 1～5 – A "buzzing" type of waveform with harmonics present from the fundamental on higher in decreasing amplitude. (Saw 1 has the least amount of uppr harmonics and Saw 5 has the most.)

Noise 1– A waveform consisting of all harmonics present, producing a non-pitched type of sound resembling static.

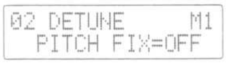
Noise 2 –Anothr noise waveform which does have the fundamntal pitch present along with the "static".

02 DETUNE

Related Functions

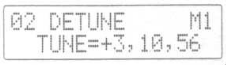
O/S EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

Parameters	**Domain**	
PITCH FIX = ON/OFF ON: RANGE = $\times 1/\times {}^{1}/_{16}$ OFF: HARMONIC = ${}^{1}/_{63} \sim 63$ TUNE = +/− (POLARITY), 0~5 (OCT), 0~11 (NOTE), 0~63 (FINE)	**Mode**	**Normal**
	Keyboard	MODULAR
	Guitar	
	Wind	



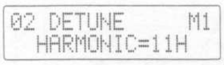
```
02 DETUNE      M1
  PITCH FIX=OFF
```

A



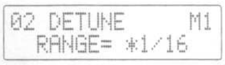
```
02 DETUNE      M1
  TUNE=+3,10,56
```

B



```
02 DETUNE      M1
 HARMONIC=11H
```

C



```
02 DETUNE      M1
  RANGE= *1/16
```

D

This function lets you establish the pitch independently for each module. By detuning some modules, you can create a "thick" sound, or emphasize certain "harmonic", etc.

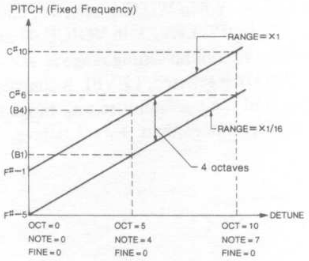
The PITCH FIX parameter can also be set in this function. This lets you simulate the "attack" sound of certain instruments, by fixing the frequency of one module so that the same pitch is produced by any note number.

Parameters with PITCH FIX set to OFF (normal detuning)
HARMONIC: Used to set the harmonic level at which the detuned module will sound in comparison with the standard frequency. When the harmonic level is set, other parameters are adjusted to appropriate corresponding levels automatically. At a value of "1," the standard frequency is specified and no detuning is effected.
With PITCH FIX set to OFF, the TUNE parameter features a total of four different settings; Polarity, Octave, Note and Fine Tuning.
POLARITY (POL): Used to specify whether the module will be tuned above (+) or below (−) the standard frequency.
OCTAVE (OCT): Used to raise pitch in 1-octave increments.
NOTE (NOTE): Used to raise or lower fixed pitch in halftone (100-cent) increments.
FINE TUNING (FINE): Used to alter pitch in 1.6-cent increments (approximate).

When detuning is effected with the NOTE and FINE parameters, the resulting harmonic will not be an "exact" harmonic of the standard frequency. Because of this, "H" and "L" marks to the right of the HARMONIC indicate that the harmonic is slightly higher or lower than the displayed harmonic value (differs with detuning).
(FIG-C)

Parameters with PITCH FIX set to ON
RANGE (×1 or 1/16): When set to "×1", the "octave range" of the fixed-pitch sound will correspond to the MIDI instrument pitch (and OCTAVE parameter setting), within a range of approximately F# -1 to C# 10.

By selecting the "×1/16" parameter (FIG-D), the fixed-pitch sound will be shifted to a range is equal to F# -5 to approximately C# 6. (In some cases, the sound will not be audible, as it's frequency is too low for the human ear. Try raising the OCT value in this case.)



With PITCH FIX set to ON, the TUNE parameter features a total of four different settings; Octave, Note and Fine Tuning.
OCTAVE: Used to raise pitch in 1-octave increments. (When the NOTE parameter is set to a value higher than "7", the OCTAVE parameter can be set between "0" and "9".)
NOTE (NOTE): Used to raise or lower fixed pitch in halftone (100-cent) increments. (When OCT is set to "10," this range is limited to between "0" and "7.")
FINE TUNING (FINE): Used to alter pitch in 1.6-cent increments.

COPY/INITIALIZE
This function features COPY and INITIALIZE functions which allow you to "copy" detune specifications from one module to another, and to "reset" the selected module to an initialized setting (DETUNE OFF).
To COPY the detuning specifications of the selected module to another module, first select VOICE-02 and the module containing the detune settings you want to copy from. Next, hold down the WRITE key and then press the PROG NO key corresponding to the module you want to copy into.
To INITIALIZE the selected module, first select VOICE-02 and the module containing the detuning specifications you want to initialize. Next, hold down the WRITE key and then press the YES key. Detuning settings will be reset to initialized values (DETUNE OFF).

03 PITCH ENV (DCO)

Related Functions
VOICE—04, 05, 17, 18

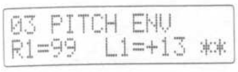
Parameters

R1 ~ R8 (RATE) = 0 ~ 99
L1 ~ L8 (LEVEL) = −63 ~ +63
SS = SUSTAIN STEP (YES key)
ED = END (NO key)

O/S EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

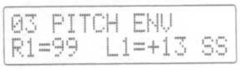
Domain

Mode	Normal
Keyboard	GLOBAL
Guitar	
Wind	



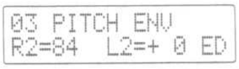
```
03 PITCH ENV
R1=99  L1=+13 **
```

A



```
03 PITCH ENV
R1=99  L1=+13 SS
```

B



```
03 PITCH ENV
R2=84  L2=+ 0 ED
```

C

The DCO envelope determines the change in pitch over time for all 8 modules. The unit features 8-step envelopes, which means that RATEs and LEVELs can be set at up to 8 points in the envelope.

A level value of "0" indicates no change in pitch. (standard pitch played on keyboard). This means that positive values cause the pitch to rise, while negative values lower the pitch.

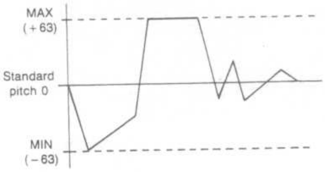
SS & ED POINTS
In addition to RATE and LEVEL values, SS (Sustain, FIG-B) and ED (End, FIG-C) points can be specified at any step in the DCO envelope.

- To enter an SS point in any step, press the YES (VALUE ▲).

When a sustain point is inserted in the envelope, the PITCH will be sustained until a note off message is received. The step immediately following the SS step then becomes the "release" point (as in ADSR type pitch envelopes).

- To delete a sustain point, press the YES (VALUE ▲) key once again.

- To enter an ED point in any step, simply press the NO (VALUE ▼) key.



As there are up to 8 steps in the DCO envelope, the end point is initially set in step 8. The end point can be moved to any step, however subsequent steps will automatically be deleted.

Note that ED points can be set for any step, regardless of its LEVEL value.

- To delete the end point from any step (1 through 7), simply move the cursor to the step and press the NO (VALUE ▼) key once again. The end point returns to step 8 automatically.

Note that the actual change affected by the level parameter depends on the setting of the envelope depth in VOICE-04. When this depth is at its maximum, a value of −63 to +63 represents more than a 5-octave change in pitch (up or down).

INITIALIZE
To INITIALIZE the patch, first select VOICE-03 and the module containing the specifications you want to initialize. Next, hold down the WRITE key and then press the YES key.

Note that when this function is initialized, the PITCH ENVELOPE of the selected module as well as enabled steps in the PITCH ENV of VOICE-18 are initialized.

04 P ENV DEPTH (DCO)

Related Functions
VOICE—03, 05

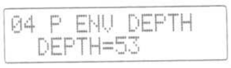
Parameters

DEPTH = 0 ~ 63
RANGE = WIDE / NARROW

O/S EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

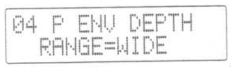
Domain

Mode	Normal
Keyboard	GLOBAL
Guitar	
Wind	



```
04 P ENV DEPTH
  DEPTH=53
```

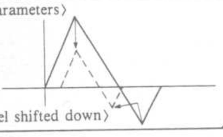
A



```
04 P ENV DEPTH
  RANGE=WIDE
```

B

〈Envelope set using VOICE-03 parameters〉



〈Actual envelope level shifted down〉

C

This function contains two parameters — DEPTH and RANGE. Both of these parameters affect the DCO ENVELOPE settings which are specified in function 03 (VOICE-03).

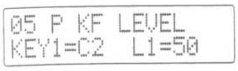
The ENVELOPE DEPTH parameter can be used to "shift" the level of the entire envelope produced using the DCO ENVELOPE parameters (03). At a value of "63", the envelope is produced as set in VOICE-03. And at a value of "0", the pitch is not changed by DCO ENVELOPE set in VOICE-03.

The RANGE parameter is a toggle which can be set to either WIDE or NARROW. When WIDE is selected, units used in setting the ENVELOPE LEVEL in VOICE-03 are equal to 100 cents and the maximum setting range is +/− 5 octaves. When NARROW is selected, LEVEL is changed in 25-cent increments, and the maximum setting range is decreased to approximately more than +/−1 octave.

05 P KF LEVEL (DCO)

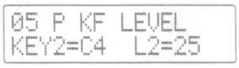
Related Functions
VOICE—03, 04, 16

Parameters	**O/S** EDIT—PAGE DOWN—PAGE—CURSOR—VALUE	
	Domain	
KEY 1 ~ KEY 6 = C0 ~ C9 L1 ~ L6 (LEVEL) = 0 ~ 63	**Mode**	**Normal**
	Keyboard	GLOBAL
	Guitar	
	Wind	



```
05 P KF LEVEL
KEY1=C2  L1=50
```

A

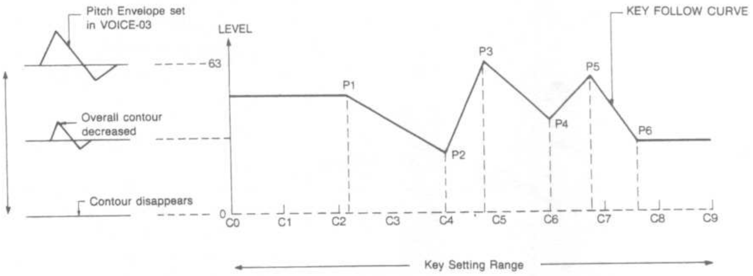


```
05 P KF LEVEL
KEY2=C4  L2=25
```

B

The parameters in this function are used to determine how Keyboard Follow (KF) affects the DCO envelope (pitch) produced using the parameters in VOICE-03 and VOICE-04. The unit features 6-step keyboard follow, which means that LEVELs can be set at 6 points in the KEYBOARD FOLLOW CURVE.

The key parameter represents positions in the Key Setting Range (C0 ~ C9). In this state, each "POINT" in the KF curve can be moved in harf-tone increments. As the "LEVEL" parameter value is increased, the contour of the curve is increased, while it is decreased as the value is decreased.


Pitch Envelope set in VOICE-03
Overall contour decreased
Contour disappears
LEVEL
63
0
P1
P2
P3
P4
P5
P6
KEY FOLLOW CURVE
C0
C1
C2
C3
C4
C5
C6
C7
C8
C9
Key Setting Range

POINT	P1	P2	P3	P4	P5	P6
KEY	E2	C4	A4	C6	A♭6	F♯7
LEVEL	50	25	63	35	57	28

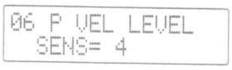
06

P VEL LEVEL (DCO)

Related Functions
VOICE—03, 04, 05

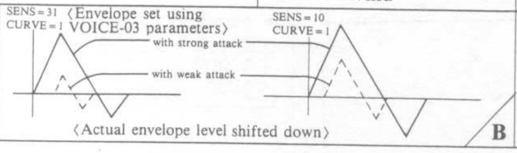
Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
SENS (SENSITIVITY) = 0 ~ 31 CURVE = 1 ~ 8		

Domain	
Mode	**Normal**
Keyboard	GLOBAL
Guitar	
Wind	



```
06 P VEL LEVEL
  SENS= 4
```

A


SENS = 31
CURVE = 1
⟨Envelope set using VOICE-03 parameters⟩
with strong attack
with weak attack
SENS = 10
CURVE = 1
⟨Actual envelope level shifted down⟩

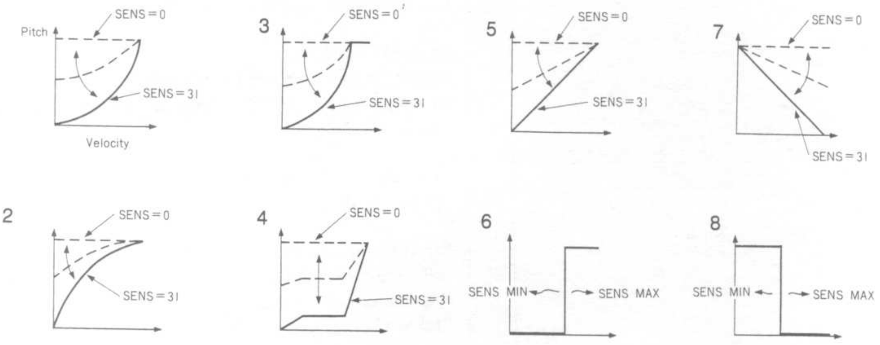
B

This function features 2 basic parameters which are used to contour the velocity level message control over the DCO (pitch) envelope's level for all modules (M1 ~ M8). In other words, these settings — SENSITIVITY and CURVE — determine how responsive all 8 modules will be to key touch dynamics with regards to changes in pitch.

The CURVE parameter lets you choose from any of 8 different velocity curves, which determine the contour of velocity message control over time. The SENSITIVITY parameter lets you set the range of change in the DCO ENVELOPE by velocity message control. At a setting of "0", the selected module will be totally unresponsive to velocity message control — in other words, your keyboard attack will have no effect over changes in pitch. A setting of "31" indicates maximum sensitivity. (FIG-B)

The CURVE parameter is used to select one of the 8 velocity curves (contours) as shown in the figures below. These curves determine how the pitch actually changes over time.

[CURVES]



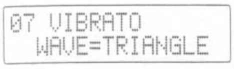
07 VIBRATO (DCO)

Related Functions

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
WAVE = TRIANGLE / SAW UP / SAW DOWN / SQUARE DEPTH = 0 ~ 99 RATE = 0 ~ 99 DELAY = 0 ~ 99 MULTI = ON / OFF		

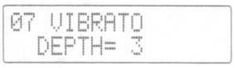
Domain

Mode	Normal
Keyboard	GLOBAL
Guitar	
Wind	



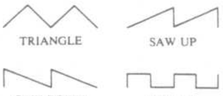
```
07 VIBRATO
  WAVE=TRIANGLE
```

A



```
07 VIBRATO
  DEPTH= 3
```

B



C

The VIBRATO function corresponds to the LFO of an analog synthesizer. It oscillates the low frequencies of the DCO, and this oscillation adds a "vibrato" effect to the selected waveform. There are five basic parameters within this function — WAVE, DEPTH, RATE, DELAY and MULTI.

The WAVE parameter lets you choose the basic waveform of the vibrato oscillation. There are 4 — SQUARE, SAW DOWN, SAW UP, and TRIANGLE. (FIG-C) (See information below for details on various types of waveforms which can be selected.)

You can use the DEPTH parameter to set the "depth" of vibrato oscillation (how strong the vibrato is). The larger the value, the deeper the vibrato effect. (If this is set to "0", no vibrato will be generated. Be sure to raise the value before altering other settings.)

The RATE parameter is used to set the "speed" of vibrato oscillation. The higher the value, the faster the vibrato effect.

The DELAY parameter is used to set the period of time from initial note on message until the point where vibrato oscillation begins. The larger the value, the longer the delay before vibrato is applied.

The MULTI parameter features a toggle which can be set to either ON or OFF. When MULTI is set to ON, the vibrato effect is engaged independently as keys are played, so that each note's vibrato is independent (not synchronized with vibrato delay and oscillation of note messages received previously or subsequently). This effect is useful in creating "ensemble" sounds.

When this parameter is set to OFF, vibrato oscillation is synched for all notes, regardless of when they are sounded (in unison or independently).

[WAVEFORMS]
Triangle – produces a smooth repeating up and down pitch variation.
Saw Up – produces a repeating pitch rise starting from the fundamental frequency.
Saw Down – produces a repeating pitch "swoop" down from above to the fundamental frequency.
Square – produces a repeating "trill" between the original pitch and a higher pitch.

08 OCTAVE

Related Functions

Parameters	**O/S** EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
OCTAVE= −2/−1/0/+1/+2	

Domain

Mode	**Normal**
Keyboard	GLOBAL
Guitar	
Wind	

```
08 OCTAVE= 0
```

A

```
08 OCTAVE=+1
```

B

This function features only one parameter — OCTAVE, which is used to raise or lower the overall octave of all 8 modules (M1 ~ M8) globally. At a value of "0", the octave for all 8 modules is set at the standard pitch level (A4 = 442Hz). (This is assuming that "Detune" is set to "Harmonic 1" for the module in question. . . . .). You can raise or lower the octave by a maximum of 2 octaves, in 1-octave increments.

09 AMP ENV (DCA)

Related Functions
VOICE—10, 11, 17, 19

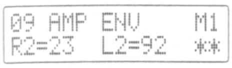
Parameters

R1 ~ R8 (RATE) = 0 ~ 99
L1 ~ L8 (LEVEL) = 0 ~ 99
SS = SUSTAIN STEP (YES key)
ED = END (NO key)

O/S EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

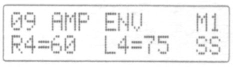
Domain

Mode	Normal
Keyboard	MODULAR
Guitar	
Wind	



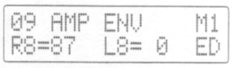
```
09 AMP ENV     M1
R2=23  L2=92   **
```

A



```
09 AMP ENV     M1
R4=60  L4=75   SS
```

B



```
09 AMP ENV     M1
R8=87  L8= 0   ED
```

C

This function basically contains 8 "STEPs", each of which is broken down into RATEs and LEVELs which you can use to create 8-step (maximum) amplitude envelopes for each module (M1 ~ M8).

These DCA "envelopes" determine how the amplitude (remember, amplitude = loudness) of each module changes over time. In other words, the sound attack and decay, and all the changes in volume which the sound goes through in between.
Furthermore, as mentioned in the section on the iPD Sound Source, if the module LINE is set to EXT PHASE for the next LINE, ENVELOPE DCA affects the timbre of the succeeding LINE.

(For more information on ENVELOPEs, RATEs, LEVELs and STEPs, refer to the VZ Sound Seminar.)

SS & ED POINTS

In addition to RATE and LEVEL values, SS (Sustain, FIG-B) and ED (End, FIG-C) points can be specified at any step in the DCA envelope.

- To enter an SS point in any step, simply press the YES (VALUE ▲).

When a sustain point is inserted in the envelope, the sound will be sustained until a note off message is received. The step immediately following the SS step then becomes the "release" point (as in ADSR type amplitude envelopes).

- To delete a sustain point, press the YES (VALUE ▲) key once again.

- To enter an ED point in any step, simply press the NO (VALUE ▼) key.
  As there are up to 8 steps in the DCA envelope, the end point is initially set in step 8. The end point can be moved to any step, however subsequent steps will automatically be deleted.

To delete the end point from any step (1 through 7), simply move the cursor to the step and press the NO (VALUE ▼) key once again. The end point returns to step 8 automatically.

COPY / INITIALIZE

This function features COPY and INITIALIZE functions which allow you to "copy" DCA specifications from one module to another, and to "reset" the selected module to an initialized setting.
To COPY the DCA specifications of the selected module to another module, first select VOICE-09 and the module containing the detune settings you want to copy from. Next, hold down the WRITE key and then press the MODULE SELECT key corresponding to the module you want to copy into. When this procedure is carried out, complete DCA data (VOICE-10, 11, 12, 14, 17) is copied into the destination module.
To INITIALIZE the selected module, first select VOICE-09 and the module containing the specifications you want to initialize. Next, hold down the WRITE key and then press the YES key. DCA settings for VOICE-09 and VOICE-19 (VEL RATE) will be reset to initialized values.

Note that when this function is initialized, the AMP ENVELOPE of the selected module, as well as enabled steps in the AMP ENV of VOICE-19 are initialized.

10 ENV DEPTH (DCA)

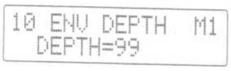
Related Functions
VOICE—09, 11

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

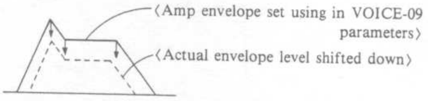
ENV DEPTH = 0 ~ 99

Domain

Mode	Normal
Keyboard	MODULAR
Guitar	
Wind	



```
10 ENV DEPTH  M1
  DEPTH=99
```


(Amp envelope set using in VOICE-09 parameters)
(Actual envelope level shifted down)
B

This function lets you raise or lower the entire contour of the DCA envelopes for all 8 modules, created using VOICE-09 (DCA Envelope). Note that this function has no direct effect on the actual envelope, but simply raises or lowers its overall "level". Simply speaking, the overall volume level of the selected module is decreased as you lower the ENV DEPTH level. Settings can be made for all 8 modules independently.

11 KF LEVEL (DCA)

Related Functions
VOICE—09, 10

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
KEY 1~KEY 6=C0~C9 L1~L6 (LEVEL)=0~99		

Domain	
Mode	**Normal**
Keyboard	MODULAR
Guitar	
Wind	

```
11 KF LEVEL    M1
KEY1=E2  L1=79
```

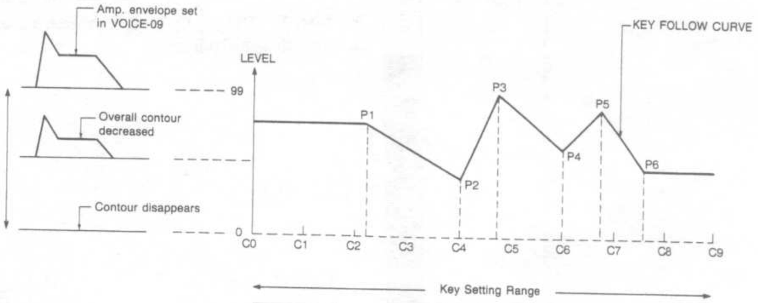
A

```
11 KF LEVEL    M1
KEY6=F#7 L6=44
```

B

The parameters in this function are used to determine how Keyboard Follow (KF) affects the DCA envelope (loudness) produced using the parameters in VOICE-09 and VOICE-10. The unit features 6-step keyboard follow, which means that LEVELs can be set at 6 points in the KEYBOARD FOLLOW CURVE.

The settings for this function are made in exactly the same way is in the DCO (pitch) KF LEVEL function (VOICE-05). But, DCA KF LEVEL can be set for each MODULE independently.



POINT	P1	P2	P3	P4	P5	P6
KEY	E2	C4	A4	C6	A♭6	F♯7
LEVEL	79	40	99	56	90	44

12

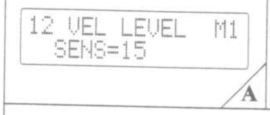
VEL LEVEL (DCA)

Related Functions
VOICE—09, 10, 11
EFFECT—14

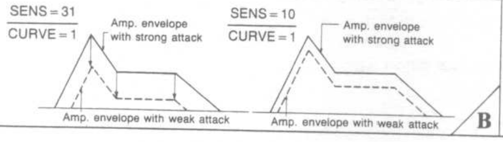
Parameters	**O/S**	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
SENS (SENSITIVITY) = 0 ~ 31 CURVE = 1 ~ 8		

Domain

Mode	**Normal**
Keyboard	MODULAR
Guitar	
Wind	



```
12 VEL LEVEL   M1
  SENS=15
```



SENS = 31
CURVE = 1
Amp. envelope with strong attack
Amp. envelope with weak attack
SENS = 10
CURVE = 1
Amp. envelope with strong attack
Amp. envelope with weak attack
B

This function features 2 basic parameters which are used to contour the key-touch control over the DCA (amplifier) envelope's level, for each module (M1 ~ M8). In other words, these settings — SENSITIVITY and CURVE — determine how responsive the waveform produced by any given module will be to key touch dynamics.

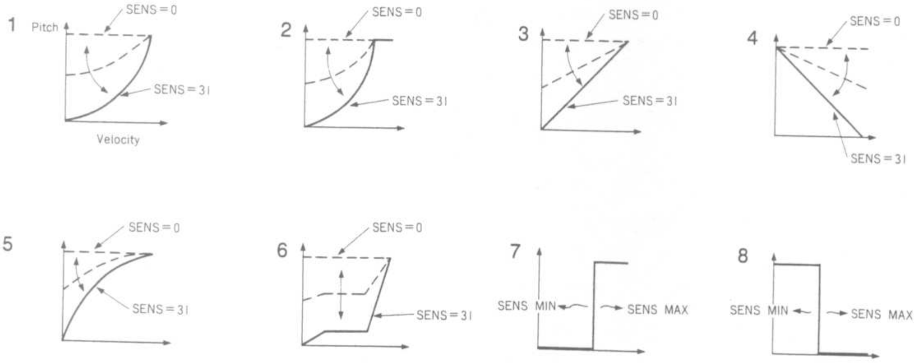
The CURVE parameter lets you choose from any of 8 different velocity curves, which determine the contour of velocity control over time. The SENSITIVITY parameter lets you select values between "0" and "31". At a setting of "0", the selected module will be totally unresponsive to velocity control message. A setting of "31" indicates maximum sensitivity.

The CURVE parameter is used to select one of the 8 velocity curves (contours) as shown in the figures below. These curves determine how the amplitude actually changes with key velocity.

Notice that if you choose — for example — curve 7 for one module and curve 8 for another, each will sound quite differently according to the velocity message.

Note that the degree of this effect is dependent on settings mode in VOICE-10 (AMP ENV) as well as in VOICE-11 (KF. ENV.)

[CURVES]



1
Pitch
SENS = 0
SENS = 31
Velocity
2
SENS = 0
SENS = 31
3
SENS = 0
SENS = 31
4
SENS = 0
SENS = 31
5
SENS = 0
SENS = 31
6
SENS = 0
SENS = 31
7
SENS MIN
SENS MAX
8
SENS MIN
SENS MAX

13 TREMOLO

Related Functions
VOICE—14

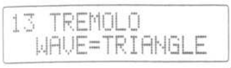
Parameters

WAVE = TRIANGLE / SAW UP /
SAW DOWN / SQUARE
DEPTH = 0 ~ 99
RATE = 0 ~ 99
DELAY = 0 ~ 99
MULTI = ON / OFF

O/S EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

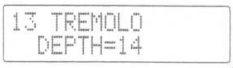
Domain

Mode	**Normal**
Keyboard	GLOBAL
Guitar	
Wind	



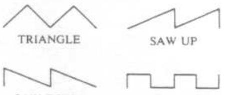
```
13 TREMOLO
  WAVE=TRIANGLE
```

A



```
13 TREMOLO
  DEPTH=14
```

B



C

Tremolo is a form of low-frequency oscillation which affects the DCA to produce cyclical changes in volume characteristics. The parameters in this function are used to create a "tremolo" effect globally. Note, however, that settings for parameters in VOICE-14 (AMP SENS) can be made independently for each module. This allows you to control the depth of each module independently, while settings in the TREMOLO function (VOICE-13) are used to create and control the "actual" tremolo oscillation.

The WAVE parameter lets you choose the basic waveform of the tremolo oscillation. There are 4 — SQUARE, SAW DOWN, SAW UP, and TRIANGLE. (See information below for details on how various types of waveforms affect volume changes.)

You can use the DEPTH parameter to set the "depth" of tremolo oscillation (how strong the tremolo is). The larger the value, the deeper the tremolo effect. (If this parameter is set to "0", no tremolo will be generated. Be sure to raise this level before altering other parameter settings.)

The RATE parameter is used to set the "speed" of tremolo oscillation. The higher the value, the faster the tremolo effect.

The DELAY parameter is used to set the period of time from initial key depression until the point where tremolo oscillation begins. The larger the value, the longer the delay before tremolo is applied.

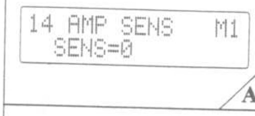
The MULTI parameter features a toggle which can be set to either ON or OFF. When MULTI is set to ON, the tremolo effect is engaged independently as Note On messages are received, so that each note's tremolo is independent (not synchronized with tremolo delay and oscillation of messages received previously or subsequently). When this parameter is set to OFF, tremolo oscillation is synched for all keys, regardless of when the note on messages are received (in unison or independently).

[WAVEFORMS]
Triangle – produces a smooth "pulsating" volume shift.
Saw Up – produces a repeating rise and then cutoff in volume.
Saw Down – produces a repeating "swoop" down in volume.
Square – produces an "on and off" volume characteristic.

14 AMP SENS (DCA)

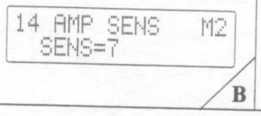
Related Functions
VOICE—13
EFFECT—03～06, 19

Parameters	**O/S**	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE	
		Domain	
SENS (SENSITIVITY) = 0～7		**Mode**	**Normal**
		Keyboard Guitar Wind	MODULAR



```
14 AMP SENS    M1
  SENS=0
```

A



```
14 AMP SENS    M2
  SENS=7
```

B

This function features only one parameter, SENSITIVITY, which is set independently for each module. This "sensitivity" level determines how "sensitive" each module is to the effects listed below. (Or, in simpler terms, SENSITIVITY determines the degree of "depth" or "strength" the effects have in the specified module.)

〈Related Functions〉
VOICE-13 TREMOLO DEPTH
EFFECT-03 TREMOLO DEPTH (After Touch)
EFFECT-04 TREMOLO DEPTH (Modulation Wheel)
EFFECT-05 TREMOLO DEPTH (Definable Control)
EFFECT-06 TREMOLO DEPTH (Foot VR)
EFFECT-03 DCA ENV BIAS (After Touch)
EFFECT-04 DCA ENV BIAS (Modulation Wheel)
EFFECT-05 DCA ENV BIAS (Definable Control)
EFFECT-06 DCA ENV BIAS (Foot VR)
EFFECT-19 DEPTH (Total Tremolo)

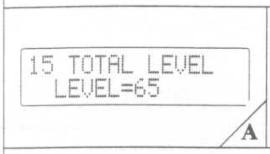
When SENSITIVITY is set to a value of "0", the all effects listed below will not affect the specified module's sound. At a value of "7", the effects will be strongest.

15 TOTAL LEVEL (DCA)

Related Functions

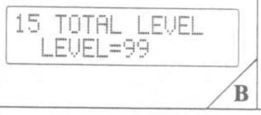
O/S EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

Parameters	**Domain**	
	Mode	**Normal**
LEVEL = 0 ~ 99	Keyboard	GLOBAL
	Guitar	
	Wind	



```
15 TOTAL LEVEL
  LEVEL=65
```

A



```
15 TOTAL LEVEL
  LEVEL=99
```

B

This function features only one parameter, TOTAL LEV, which is used to control the overall amplitude (volume) level of the unit (for all modules, M1 ~ M8).

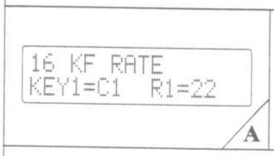
This parameter acts as a "governer", controlling the maximum possible volume level which can be attained with the volume control. With a value of "0", no sound is output — even when the volume slider is set to MAX. The maximum amplitude level can be selected by inputting a level of "99".

16

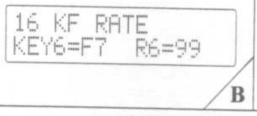
KF RATE (DCO/DCA)

Related Functions
VOICE—03, 05, 09, 11

<table>
<tr><th rowspan="2">Parameters</th><th>O/S</th><th colspan="2">EDIT—PAGE DOWN—PAGE—CURSOR—VALUE</th></tr>
<tr><th colspan="3">Domain</th></tr>
<tr><td rowspan="4">KEY 1~KEY 6=C0~C9
R1~R6 (RATE)=0~99</td><td colspan="2">Mode</td><td>Normal</td></tr>
<tr><td colspan="2">Keyboard</td><td rowspan="3">GLOBAL</td></tr>
<tr><td colspan="2">Guitar</td></tr>
<tr><td colspan="2">Wind</td></tr>
</table>


16 KF RATE
KEY1=C1 R1=22

A

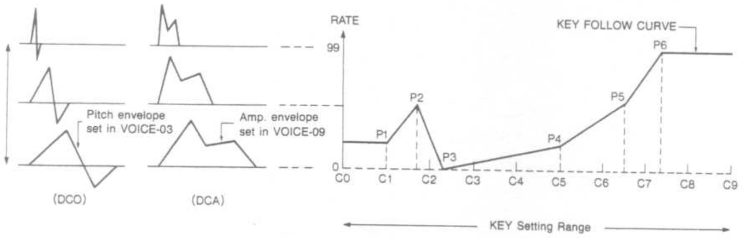

16 KF RATE
KEY6=F7 R6=99

B

This function features a total of 6 "POINTs", which are used to create a KEY FOLLOW CURVE. This function is directly related to the KF LEVEL functions (VOICE-05 and VOICE-11). Notice that with the LEVEL functions, you can set specify KEYs and LEVELs for each POINT in the curve(s). The KF RATE function is used to specify the RATE (remember, rate and level together determine time) for each point in the curve.

These settings are global, affecting all DCO and DCA envelopes (VOICE-03 and VOICE-09).

In steps where the rate value is higher, a rapid "attack" or "decay" is effected. In a position where the rate value is low, the rate of the envelope is equal to that set in VOICE-03 and VOICE-09.


Pitch envelope set in VOICE-03
Amp. envelope set in VOICE-09
(DCO)
(DCA)
RATE
99
0
KEY FOLLOW CURVE
P1
P2
P3
P4
P5
P6
C0
C1
C2
C3
C4
C5
C6
C7
C8
C9
KEY Setting Range

POINT	P1	P2	P3	P4	P5	P6
KEY	C1	A1	E2	C5	F♯6	F7
RATE	22	50	0	22	53	99

17, 18, 19 VEL RATE (DCO/DCA)

Related Functions
17; VOICE—03, 09, 18, 19
18; VOICE—03, 17
19; VOICE—09, 17

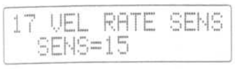
O/S EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

Parameters

17 ⟨VEL RATE SENS⟩
SENS (SENSITIVITY) = 0 ~ 31
CURVE = 1 ~ 8
18 ⟨P VEL RATE⟩
ENA = E / *
19 ⟨A VEL RATE⟩
ENA = E / *

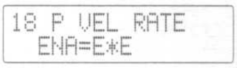
Domain

Mode	Normal
Keyboard Guitar Wind	17, 18 } GLOBAL 19 MODULAR



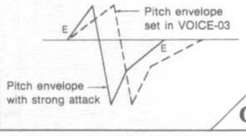
```
17 VEL RATE SENS
  SENS=15
```

A

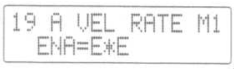


```
18 P VEL RATE
  ENA=E*E
```

B


E
Pitch envelope set in VOICE-03
E
Pitch envelope with strong attack

C



```
19 A VEL RATE M1
  ENA=E*E
```

D

This function features parameters which are used to control velocity RATE, in correspondence with DCO and DCA envelopes created using VOICE-03 and VOICE-09.

While the velocity RATE setting is global (affects all 8 modules), you can choose whether RATE control is enabled or disabled for each step in both the DCO and DCA envelopes.

Within function No. 17 ("VEL RATE SENS"), the SENSITIVITY and CURVE parameters can be selected.

When SENSITIVITY is set to a value of "0", velocity will be disabled entirely. As SENSITIVITY is raised, the envelope rate becomes more acute when the external keyboard is played with a strong (fast) attack (high "velocity").

The CURVE parameter lets you choose from one of 8 different VELOCITY RATE curves, as diagrammed below. The horizontal axis of the VELOCITY CURVE represents additive values to the rate parameter. As the value is increased, the rate of steps in the envelope (DCO / DCA) are increased further.

Within function No. 18 ("P VEL RATE"), you can specify whether or not the VEL RATE curve will affect the individual steps of the PITCH ENV (DCO envelope) which is set using VOICE-03.
This setting is global, affecting all 8 modules (M1 ~ M8).

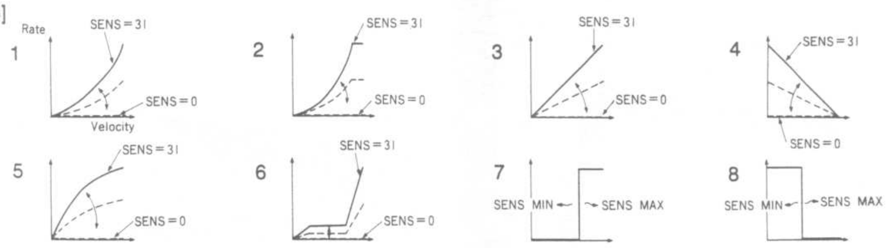
To ENABLE (make effective) the VEL RATE for any step in the envelope, simply move the cursor to the desired step position and press the YES key ("E" is displayed). To disable, simply press the NO key ("*" is displayed). (If you set less than 8 steps, steps following END POINT are not displayed.) If the parameter is set as in FIG-B, the envelope changes as illustrated in FIG-C, with a strong attack (The rate of steps 1 and 4 become acute).

Within function No. 19 ("A VEL RATE"), you can specify whether or not the VEL RATE curve will affect the individual steps of the AMP ENV (DCA envelope) which is set using VOICE-09. These settings can be made for each module (M1 ~ M8) individually.

To ENABLE the VEL RATE for any step in the envelope, simply move the cursor to the desired step position and press the YES key ("E" is displayed). To disable, simply press the NO key ("*" is displayed).

Notice that there are no identifying "numbers" assigned to the step display. Note, however, that there are "" or "E" which corresponds to each active step position.*

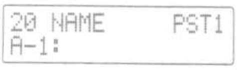
[CURVES]



20 VOICE NAME

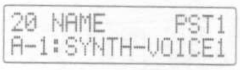
Related Functions

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
	Domain	
	Mode	**Normal**
Alphabet = A ~ Z Numeral = 0 ~ 9 Marks = " . ", " – ", " / "	Keyboard	GLOBAL
	Guitar	
	Wind	



```
20 NAME       PST1
A-1:
```

A



```
20 NAME       PST1
A-1:SYNTH-VOICE1
```

B

This function is used to assign a name to the "patches" created using other VOICE menu functions.

The names you choose may contain both letters and numbers, and may be up to 12 characters in length. Character input is carried out using the VALUE keys, with alphanumeric characters and marks being displayed cyclically by holding either VALUE key down.

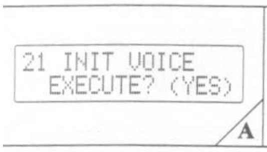
21 INIT VOICE

Related Functions

Parameters	**O/S**	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
EXECUTE? (YES) PUSH YES KEY!		

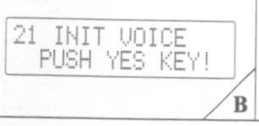
Domain

Mode	**Normal**
Keyboard	GLOBAL
Guitar	
Wind	



```
21 INIT VOICE
  EXECUTE? (YES)
```

A



```
21 INIT VOICE
  PUSH YES KEY!
```

B

This function is used to intialize all VOICE MENU data. By executing this function, initialized data is loaded to the internal memory's COMPARE/RECALL area. (Note that once initialization is completed, the COMPARE/RECALL key indicator comes ON, if the COMPARE/RECALL function has not already been selected.)

Respond to the [EXECUTE?] prompt by pressing the YES key and then press it once again to execute initialization. The display appears as in FIG-B. Parameter values and settings will all be reset to the initialized values shown on page 94 of this manual.

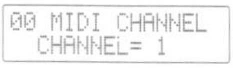
00 MIDI CHANNEL

Related Functions
TOTAL—04

Parameters	**O/S**	EDIT—PAGE—CURSOR—VALUE
CHANNEL = 1 ~ 16		

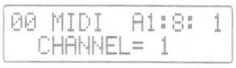
Domain

Mode	**Normal**	**Combination** 4 mix/split	**Combination** 8 mix	**Multi channel**
K	GLOBAL	GLOBAL		AREA
G		GLOBAL		
W		GLOBAL		



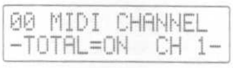
```
00 MIDI CHANNEL
  CHANNEL= 1
```

A



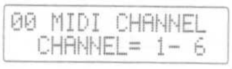
```
00 MIDI   A1:8: 1
  CHANNEL= 1
```

B



```
00 MIDI CHANNEL
-TOTAL=ON  CH 1-
```

C



```
00 MIDI CHANNEL
  CHANNEL= 1- 6
```

D

The MIDI CHANNEL function is used to assign the MIDI receive channel for the basic operating modes — the NORMAL mode, COMBI mode and MULTI-CH mode.
Note that if function 04 in the TOTAL CONTROL menu (MIDI CHANNEL) is set to ON in either the NORMAL or COMBI mode, it will be impossible to set the MIDI channel using TOTAL-04.

It's important to remember that the channel set using this function is held in Operation Memory along with other parameter settings.

Notice that in the "G" Performance Mode, the parameter is displayed as shown in FIG-D, however the cursor cannot be moved. Notice also that the number on the right changes automatically when the number on the left is altered (the number on the right being 5 "strings" higher than the number on the left).
In the MULTI CH mode, the Area Number, polyphony and MIDI channel are all shown on the display, as illustrated in FIG-B.

To select the Area Number, use the PROG NO keys. The MIDI channel number on the upper right side changes automatically when the Area Number is altered.

01 PORTAMENTO/SOLO

Related Functions

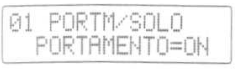
Parameters

PORTAMENTO = ON / OFF
PORTM TIME = 0 ~ 99
PORTM MODE = TIME CONST / RATE CONST
SOLO = ON / OFF
[Guitar] POLY / MONO = POLY / MONO

O/S EDIT — PAGE — CURSOR — VALUE

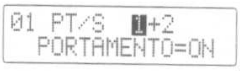
Domain

Mode	Normal	Combination		Multi channel
		4 mix/split	8 mix	
K	GLOBAL	PATCH	GLOBAL	AREA
G		GLOBAL	GLOBAL	
W		GLOBAL	GLOBAL	



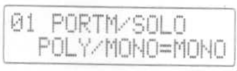
01 PORTM/SOLO
PORTAMENTO=ON

A



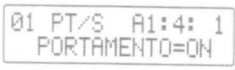
01 PT/S 1+2
PORTAMENTO=ON

B



01 PORTM/SOLO
POLY/MONO=MONO

C



01 PT/S A1:4: 1
PORTAMENTO=ON

D

The parameters in this function are used to establish and control built-in portamento and "solo" effects.

The PORTAMENTO parameter is a "toggle" (or switch) which is used to turn the portamento effect simply ON or OFF.

NOTE: The PORTAMENTO parameter must be set to "ON", in order to control portamento time using AFTER TOUCH, MOD WHEEL, DEF CONTROL or FOOT VR.

The PORTM TIME parameter determines the "portamento time" between notes — in other words, the time that it takes the pitch to "glide" from one note to the next note message received. The higher the value of this parameter, the longer the portamento time.
Note that even when the PORTM TIME is set to "0", the portamento effect can affect the overall sound, depending on the patch or sound which is being edited.
The PORTM MODE parameter determines whether the "constant" which portamento is based on. When this parameter is set to TIME CONST, the time required for pitch to glide between notes is constant — regardless of the distance between the notes. (FIG-E)

When the PORTM MODE parameter is set to RATE CONST, the rate or "speed" of portamento glide becomes constant. (FIG-F)

FIG-E

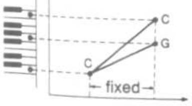
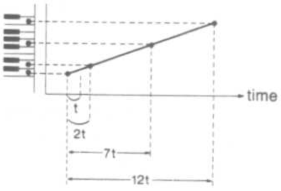


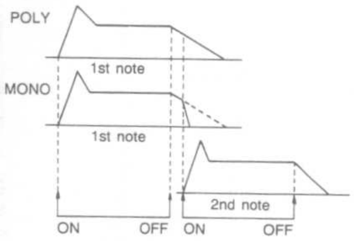
FIG-F



The SOLO parameter is a toggle which can be used to turn the solo function ON or OFF. The solo function is a "last note priority" effect. When this function is ON and more than one note on message is received, the system will cause the only the last one received to sound.
When the SOLO parameter is set to ON, Portamento effect can only be attained by legato performance (notes played without breaks in between).

When the "G" performance mode is selected, the portamento function operates as follows;
With SOLO parameter OFF: Portamento sweep executed independently for each MIDI channel (each string).
With SOLO parameter ON: Portamento sweep executed only when a NOTE ON message is generated while a previous NOTE message is still ON (legato play), regardless of MIDI channel (string).

The POLY / MONO parameter can be set in the "G" Performance Mode. When set to POLY, the notes are sound polyphonically through each MIDI channel (notes can be played during "release" time). When this parameter is set to MONO, notes through each MIDI channel are sounded only monophonically.



When PORTAMENTO-related MIDI mode messages are received, operations automatically switch to this function.

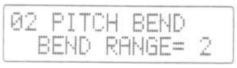
02 PITCH BEND

Related Functions

Parameters	**O/S**	EDIT—PAGE—CURSOR—VALUE
BEND RANGE = 0 ~ 48 RELEASE = ENA / DIS		

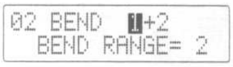
Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	GLOBAL	PATCH	GLOBAL	AREA
G		GLOBAL	GLOBAL	
W		GLOBAL	GLOBAL	



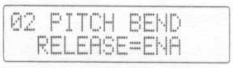
```
02 PITCH BEND
  BEND RANGE= 2
```

A



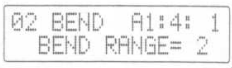
```
02 BEND   1+2
  BEND RANGE= 2
```

B



```
02 PITCH BEND
  RELEASE=ENA
```

C



```
02 BEND   A1:4: 1
  BEND RANGE= 2
```

D

This function features two parameters — BEND RANGE and RELEASE — which are used to determine how the external MIDI instrument pitch bend wheel can be used to raise or lower pitch.

The BEND RANGE parameter can be used to raise or lower the maximum limit that pitch can be bended by an external MIDI instrument, in half-step increments. At the minimum value of "0", the pitch bend wheel has no effect on pitch, while at the maximum value of "48", you can bend notes a maximum of 48 half-steps (4 octaves), up and down.

The RELEASE parameter lets you choose whether or not the external keyboard pitch bend wheel can be used to bend sounds which are sustained after the keyboard is released. When this parameter is set to DIS (disable), you can bend notes only before actually receiving note off message (before the release point in DCA curve).

When set to ENA (enable), you can also bend any note that is still sounding (portion of sound following the release point in DCA curve) — even after releasing the corresponding key on the external keyboard. (FIG-C)

In the "G" performance mode, parameters set for the sound programmed to MIDI Channel 1 affect the other 5 MIDI channels. The pitch bend message, however, can be received by each string independently.

When PITCH BEND-related MIDI mode messages are received, operations automatically switch to this function.

03 AFTER TOUCH

Related Functions
VOICE—14

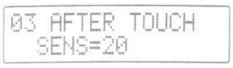
Parameters

SENSITIVITY
(NORMAL, MULTI-CHANNEL) = 0 ~ 99
(COMBINATION) = −99 ~ +99
VIB DEPTH = ON / OFF
VIB RATE = ON / OFF
PITCH = +ON / −ON / OFF
PORTM TIME = ON / OFF
TREM DEPTH = ON / OFF
TREM RATE = ON / OFF
A ENV BIAS = ON / OFF

O/S EDIT—PAGE—CURSOR—VALUE

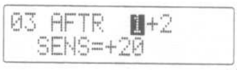
Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	GLOBAL	PATCH*1		AREA
G		PATCH*2		
W		PATCH*2		



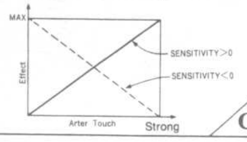
```
03 AFTER TOUCH
  SENS=20
```

A

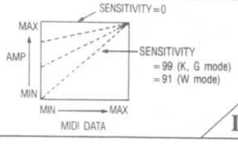


```
03 AFTR 1+2
  SENS=+20
```

B



C



D

This function is used to specify the sensitivity of an external MIDI controller "after touch", and the effects that after touch is used to control.

The SENSITIVITY parameter is used to determine how "sensitive" the external controller is to after touch. If sensitivity is high (at a level of "99", for example), it only takes a small amount of pressure on the key to engage the effect(s) which are being controlled by after touch. At a level of "0", the after touch function is totally non-operational.
In the COMBINATION mode, you can set this parameter in a range of −99 to +99 (FIG-C). When negative values are input, after touch is inversed.

The other parameters in this function are toggles, which let you determine which effects will be controlled by after touch message (and how they will be affected).
Note that these effects may already be engaged — even without using after touch. In this case, after touch can be used to make the effects "deeper" or "stronger" than the normal settings which are already engaged. For example, let's assume you have already set a VIB DEPTH value in VOICE-07 (VIBRATO function), so vibrato is engaged in your patch. If you turn the AFTER TOUCH "VIB DEPTH" parameter ON, then the vibrato depth will be increased even further when you use after touch.

The following chart lists how after touch can be used to control various sound effect functions.

VIB DEPTH = ON/OFF
ON: Vibrato depth set in VOICE-07 increased
OFF: After touch message does not control vibrato depth

VIB RATE = ON/OFF
ON: Vibrato rate set in VOICE-07 increased
OFF: After touch message does not control vibrato rate

PITCH BEND = −ON/OFF/+ON
−ON: Pitch bent down (max = 1 octave with sensitivity of "99")
OFF: After touch message does not affect pitch
+ON: Pitch bent up (max = 1 octave with sensitivity of "99")
•Pitch bend range does not correspond to EFFECT-02 setting.

PORTM TIME = ON/OFF
ON: PORTM time set in EFFECT-01 is increased
OFF: PORTM time is not affected by after touch message

Note that PORTM TIME can only be set to "ON" when the PORTM/SOLO function (EFFECT-01) "Portamento" parameter is first set to "ON".

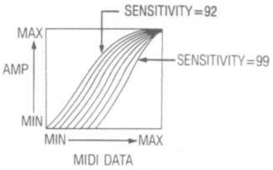
TREM DEPTH = ON/OFF
ON: Tremolo depth set in VOICE-13 is increased
OFF: Tremolo depth is not affected by after touch message

TREM RATE = ON/OFF
ON: Tremolo rate set in VOICE-13 is increased
OFF: Tremolo rate is not affected by after touch message

AMP ENV BIAS = ON/OFF
ON: Amplitude envelope bias increased by after touch message, with max. level as set in VOICE-09
OFF: Amplitude envelope bias is not affected by after touch message

In the "W" Performance Mode, aftertouch reacts slightly differently than with the other two performance modes. The curve in FIG-D shows how the SENS parameter affects after-touch characteristics when set between values of "0" and "91". Notice the changes in these characteristics between values of "92" and "99"(FIG-E). For further details, refer to page 12.

FIG-E
< SPECIAL AFTER TOUCH SENSITIVITY 92 ~ 99 >



Note that TREM DEPTH, TREM RATE and AMP ENV BIAS levels can be set for each module (M1 ~ M8) independently, in VOICE-14 (AMP SENS). Naturally, these independent settings also affect after touch message characteristics for the above parameters.

*1 In COMBI "K" mode, ON/OFF and SENSITIVITY of only the PITCH (BEND) and A ENV BIAS parameter affect the patches (1 ~ 8) independently.
*2 In COMBI "G" or "W" mode, ON/OFF and SENSITIVITY of only the PORTAMENTO TIME parameter affect the patches (1 ~ 8) globally.

04

MOD WHEEL

Related Functions
VOICE—14

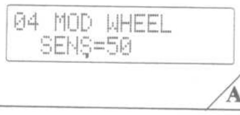
Parameters

SENSITIVITY
(NORMAL, MULTI-CHANNEL) = 0 ~ 99
(COMBINATION) = −99 ~ +99
VIB DEPTH = ON/OFF
VIB RATE = ON/OFF
PITCH = +ON/−ON/OFF
PORTM TIME = ON/OFF
TREM DEPTH = ON/OFF
TREM RATE = ON/OFF
A ENV BIAS = ON/OFF

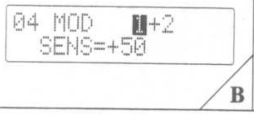
O/S EDIT—PAGE—CURSOR—VALUE

Domain

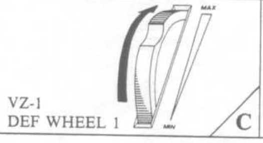
Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	GLOBAL	PATCH	COUPLE*1	AREA
G		PATCH	COUPLE*2	
W		PATCH	COUPLE*2	



```
04 MOD WHEEL
  SENS=50
```



```
04 MOD   I+2
  SENS=+50
```



The parameters in this function are used to specify the effects that will be controlled by a modulation wheel or MIDI control change No. 1 message (see accompanying MIDI implementation chart) (or when connecting to VZ-1, DEFINABLE WHEEL 1 message).

These parameters are exactly the same as those set in EFFECT-03 (AFTER TOUCH) — the only difference being that the effects are controlled during performance by MIDI control change No. 1 message using a modulation wheel, instead of After Touch (both can be used...).

For details on these parameters, see "EFFECT-03 AFTER TOUCH".

Note that TREM DEPTH, TREM RATE and AMP ENV BIAS levels can be set for each module (M1 ~ M8) independently, in VOICE-14 (AMP SENS). As with after touch, these independent settings also affect MIDI control change No. 1 message control of the above parameters.

*1 In COMBI "K" mode, ON/OFF and SENSITIVITY of only the PITCH and A ENV BIAS parameters affect to the patches in couples. (1&5, 2&6, 3&7, 4&8)
*2 In COMBI "G" or "W" mode, ON/OFF and SENSITIVITY of only the PORTAMENTO TIME parameter affect the patches (1 ~ 8) globally.

05 DEF CONTROL

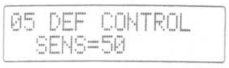
Parameters

SENSITIVITY
(NORMAL, MULTI-CHANNEL) = 0 ~ 99
(COMBINATION) = −99 ~ +99
VIB DEPTH = ON/OFF
VIB RATE = ON/OFF
PITCH = +ON/−ON/OFF
PORTM TIME = ON/OFF
TREM DEPTH = ON/OFF
TREM RATE = ON/OFF
A ENV BIAS = ON/OFF

O/S EDIT—PAGE—CURSOR—VALUE

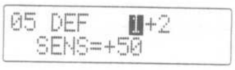
Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	GLOBAL	PATCH	COUPLE*1	AREA
G		PATCH	COUPLE*2	
W		PATCH	COUPLE*2	



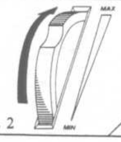
```
05 DEF CONTROL
  SENS=50
```

A



```
05 DEF     1+2
  SENS=+50
```

B



VZ-1
DEF WHEEL 2

C

The parameters in this function are used to specify the effects that will be controlled by MIDI Control change No. 12 ~ 31 messages (for details see accompanying MIDI implementation chart), or when connecting to VZ-1, DEFINABLE WHEEL 2 message.

These parameters are exactly the same as those set in EFFECT-03 (AFTER TOUCH) — the only difference being that the effects are controlled during performance by using MIDI Control change No. 12 ~ 31 messages, instead of After Touch message or modulation wheel message.

For details on these parameters, see "EFFECT-03 AFTER TOUCH".

Note that TREM DEPTH, TREM RATE and AMP ENV BIAS levels can be set for each module (M1 ~ M8) independently, in VOICE-14 (AMP SENS). As with after touch, these independent settings also affect MIDI Control change No. 12 ~ 31 message control of the above parameters. (The MIDI control change number can be using TOTAL-05, the MIDI DATA function.)

*1 In COMBI "K" mode, ON/OFF and SENSITIVITY of only the PITCH and A ENV BIAS parameters affect to the patches in couples. (1&5, 2&6, 3&7, 4&8)

*2 In COMBI "G" or "W" mode, ON/OFF and SENSITIVITY of only the PORTAMENTO TIME parameter affect the patches (1 ~ 8) globally.

06 FOOT VR

Related Functions
VOICE—14

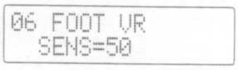
Parameters

SENSITIVITY
(NORMAL, MULTI-CHANNEL)=0~99
(COMBINATION)= −99~ +99
VIB DEPTH=ON/OFF
VIB RATE=ON/OFF
PITCH= +ON/−ON/OFF
PORTM TIME=ON/OFF
TREM DEPTH=ON/OFF
TREM RATE=ON/OFF
A ENV BIAS=ON/OFF

O/S EDIT—PAGE—CURSOR—VALUE

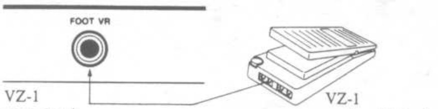
Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	GLOBAL	PATCH	COUPLE*1	AREA
G		PATCH	COUPLE*2	
W		PATCH	COUPLE*2	

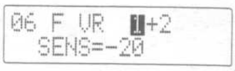


```
06 FOOT VR
  SENS=50
```

A



B



```
06 F VR  1+2
  SENS=-20
```

C

The parameters in this function are used to specify the effects that will be controlled by MIDI Control change No. 4 message (see accompanying MIDI implementation chart), or when connecting to VZ-1, Foot Control (''foot variable resistor'' — Foot VR) message.

These parameters are exactly the same as those set in EFFECT-03 (AFTER TOUCH) — the only difference being that the effects are controlled by MIDI Control change No. 4 messages, instead of After Touch messages.

For details on these parameters, see "EFFECT-03 AFTER TOUCH".

Note that TREM DEPTH, TREM RATE and AMP ENV BIAS levels can be set for each module (M1 ~ M8) independently, in VOICE-14 (AMP SENS). As with after touch, these independent settings also affect MIDI Control change No. 4 message control of the above parameters.

*1 In COMBI "K" mode, ON/OFF and SENSITIVITY of only the PITCH and A ENV BIAS parameters affect to the patches in couples. (1&5, 2&6, 3&7, 4&8)

*2 In COMBI "G" or "W" mode, ON/OFF and SENSITIVITY of only the PORTAMENTO TIME parameter affect the patches (1 ~ 8) globally.

07 FOOT SW

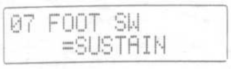
Related Functions

Parameters	**O/S**	EDIT—PAGE—CURSOR—VALUE

FOOT SW = SUSTAIN
SOSTENUTO
DISABLE

Domain

Mode	**Normal**	**Combination** 4 mix/split	8 mix	**Multi channel**
K	GLOBAL	PATCH	GLOBAL	AREA
G		PATCH	GLOBAL	
W		PATCH	GLOBAL	

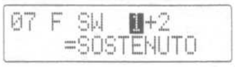


07 FOOT SW
=SUSTAIN

A

VZ-1
optional SP-2

B



07 F SW 1+2
=SOSTENUTO

C

The parameters in this function are used to specify the effects that will be controlled by MIDI control change message number 64 (refer to accompanying MIDI implementation chart). They are also used when sending sustain-pedal messages to a connected Casio MIDI keyboard.
The following chart lists what FOOT SW messages can be utilized;

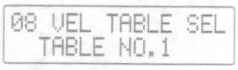
SUSTAIN: Sound is sustained before or after receiving the FOOT SW ON message until OFF message is received.
SOSTENUTO: Sound is sustained only until FOOT SW ON data is received.
DISABLE: FOOT SW ON data cannot be received.

08 VEL TABLE SELECT

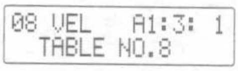
Parameters	O/S	EDIT—PAGE—CURSOR—VALUE
TABLE No. = 1 ~ 8		

Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	GLOBAL	GLOBAL		AREA
G		GLOBAL		
W		GLOBAL		


08 VEL TABLE SEL
TABLE NO.1

A

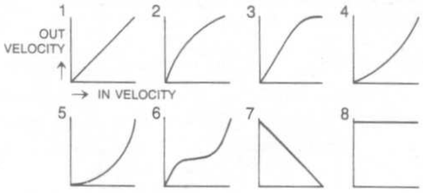

08 VEL A1:3: 1
TABLE NO.8

B

The parameter in this function is used to specify the velocity at which MIDI IN data is received. This is accomplished by selecting one of 8 built-in "tables" (curves), using the VALUE keys.

By altering the MIDI IN velocity data, it is possible to actually "correct" or "modify" the velocity curve of the transmitting MIDI device, for use with the VZ-8M. Selection can be made from the following 8 Velocity Tables;

[VEL TABLES]



NOTE;
4. With this table, you must play with a hard attack in order to produce sound.
7. Reversed curve
8. Velocity totally OFF (For use with "W" performance mode).

09

PAN

Parameters

MODE = FIX / CONTROL / AUTO

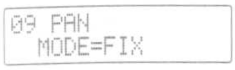
FIX: PANPOT 1/2 = −15 ~ 0 ~ +15
CONTROL:
CONTROL 1/2 (CONTROLLER)
= AFTER / FT VR / MOD / DEF / PAN
RANGE 1/2 = L / R / C→L / R / C

AUTO:
PAN 1/2 = ON / OFF
RATE = 0 ~ 63
DEPTH = 0 ~ 31
CONTROL (CONTROLLER)
= AFTER / FOOT VR / MOD / DEF / OFF

O/S EDIT — PAGE — CURSOR — VALUE

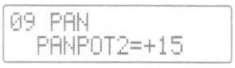
Domain

Mode	**Normal**	**Combination** **4 mix/split**	**8 mix**	**Multi channel**
K	GLOBAL	GLOBAL		AREA
G		GLOBAL		
W		GLOBAL		



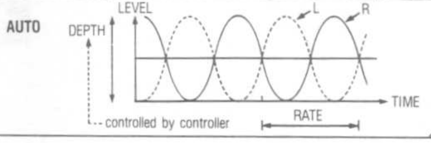
```
09 PAN
  MODE=FIX
```

A



```
09 PAN
  PANPOT2=+15
```

B



C

The parameters in the PAN function are used to specify the "panning mode", as well as specify the actual L/R panning position for VZ-8M sound source outputs 1 and 2.

Output Channels

Depending on the mode selected, sounds are output through channel 1 or channel 2, as shown in the chart below;

MODES	CHANNEL 1	CHANNEL 2
NORMAL K	Switched between 1 and 2 according to order of MIDI IN NOTE ON messages.	
G*1	MIDI CH +2/+4	MIDI CH +1/+3/+5
W	Switched between 1 and 2 according to order of MIDI IN NOTE ON messages.	
COMBINATION 1+2	1	2
3+4	3	4
1+2+3+4	1, 2	3, 4
1/3	1	3
1/3+4	1	3, 4
1+2/3	1, 2	3
1+2/3+4	1, 2	3, 4
1/2/3/4	1, 2	3, 4
1+2+3+4+5+6+7+8	1, 2, 3, 4	5, 6, 7, 8
MULTI CHANNEL*2	AREA 1~4	AREA 5~8

*1 Reception in "G" performance mode is limited to six channels between MIDI CH and MIDI CH+5.

*2 Sounds are output through channel 1 and 2 separately if areas 1~4 and areas 5~8 are set for 4-poly performance, respectively.

Initially, you must select one of three PAN "modes" — FIX, CONTROL or AUTO.

In the FIX mode, the PAN function acts as a two-channel mixer, fixing the position of the "panpot" for each channel. In the CONTROL mode, each of the two panpots can be controlled by an independent external controller, such as a modulation wheel, foot VR, etc. This allows actual "manual" panning during performance. In the AUTO mode, both panpots can be programmed to "pan" the sound of each channel over time — automatically.

Parameters with mode set to "FIX"

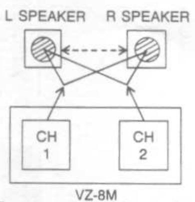
PANPOT 1/2: Used to specify localization from OUTPUT 1 or 2. Note that "0" is equivalent to a "center" setting, with negative values (up to -15) panning the sound to the left, and positive values (up to +15) panning sounds to the right.

Parameters with mode set to "CONTROL"

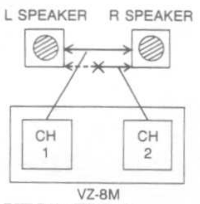
CONTROL 1/2: Allows selection of the external control device to be assigned to PANPOT1 (channel 1 sounds) with the VALUE keys. There are 5 possible choices, AFTER (aftertouch), FT VR, MOD (modulation wheel), DEF (definable control) or PAN.

RANGE 1/2: Establishes the "range" within which the controller will be able to pan the sound, as well as the panning direction. Note that the "C" stands for "center".

FIX



CONTROL



Parameters with mode set to "AUTO" (FIG-C)

PAN 1/2: Allows selection of whether or not selected PANPOT will pan automatically. This is a toggle switch which simply turns the function ON or OFF for the selected PANPOT (channel).

RATE: Universal for both PANPOT channels. This parameter is used to set panning "speed" — the higher the value, the faster panning is performed.

DEPTH: Universal for both channels. This parameter is used to set panning "depth" — the higher the value, the deeper the panning effect.

CONTROL: Establishes the external controller which can be used to manually adjust AUTO PAN depth.

In order to utilize and external controller to control panning in the MULTI CH mode or to control auto-panning depth, the MIDI channel of the controller must be the same as that set in TOTAL-04.

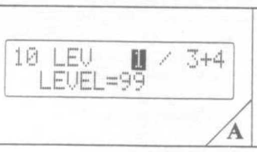
10 LEVEL

Related Functions
VOICE—15

Parameters	**O/S**	EDIT—PAGE—CURSOR—VALUE
LEVEL = 0 ~ 99		

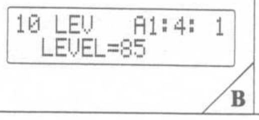
Domain

Mode	**Normal**	**Combination** **4 mix/split**	**Combination** **8 mix**	**Multi channel**
K	—	PATCH	PATCH	AREA
G		PATCH	PATCH	
W		PATCH	PATCH	



```
10 LEV   1 / 3+4
  LEVEL=99
```

A



```
10 LEV   A1:4: 1
  LEVEL=85
```

B

The parameters in this function are used to set relative volume levels of the patches "combined" in the Combination Mode. Naturally, this function can only be accessed after entering this Mode.

Up to 8 "levels" are set in this function, depending on the number of patches which are combined (according to KEY ASSIGN specifications).

If minimum value of "0" is assigned, the corresponding patch will not sound, while a value of "99" indicates a maximum volume level. These settings can be used to "mix" the relative volume levels of all patches making up the combined sound.

11 PITCH

Related Functions

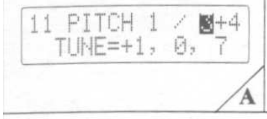
Parameters

POLARITY = + / −
OCTAVE = 0 ~ 5
NOTE = 0 ~ 11
FINE = 0 ~ 63

O/S EDIT—PAGE—CURSOR—VALUE

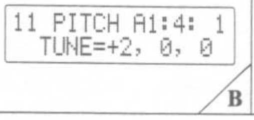
Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	—	PATCH		AREA
G		PATCH		
W		PATCH		



```
11 PITCH 1 / █+4
  TUNE=+1, 0, 7
```

A



```
11 PITCH A1:4: 1
  TUNE=+2, 0, 0
```

B

The parameters in this function are used to raise or lower the pitch of all patches used to create a "combined sound" in the Combination Mode. Naturally, this function can only be accessed after entering this mode.

The POLARITY parameter is used to specify whether pitch will be raised (+) or lowered (−).

The OCTAVE parameter is used to raise or lower the combined pitch by a maximum of 5 octaves, in 1-octave increments.

The NOTE parameter is used to raise or lower the combined pitch by a maximum of 1100 cents, in 100-cent increments.

The FINE parameter is used to make "fine tuning" adjustments in 1.6-cent increments (approximate). By making "fine" tuning adjustments, a "thick" ensemble sound can be created.

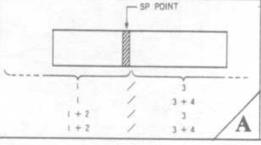
12

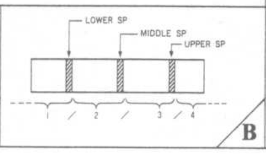
SPLIT POINT

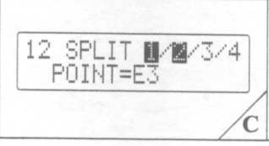
Related Functions

O/S EDIT—PAGE—CURSOR—VALUE

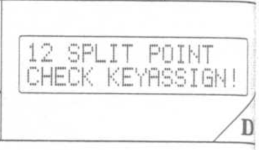
Parameters	**Mode**	**Normal**	**Combination 4 mix/split**	**Combination 8 mix**	**Multi channel**
POINT = C0 ~ C9	K	—	PATCH(Split)	—	—
	G		PATCH(Split)	—	
	W		PATCH(Split)	—	







```
12 SPLIT 1/2/3/4
  POINT=E3
```



```
12 SPLIT POINT
CHECK KEYASSIGN!
```

The parameters in this function are used to specify "keyboard split" points in the Combination Mode.

Depending on KEY ASSIGN specifications, either one or three keyboard split points are assigned using this function.

When only one split point is used, as in the KEY ASSIGN configurations in FIG-A, this function contains only one parameter — the SP POINT parameter.

When the KEY ASSIGN configuration in FIG-B is selected, the display appears as in FIG-C. In this case, there are three split points. Notice that area numbers 1 and 2 are highlighted. This indicates that the "POINT" parameter is to be set for the "LOWER" split point. For the MIDDLE split point, move the cursor so that "2" and "3" are highlighted. Likewise, when 3 & 4 are highlighted, the UPPER split point can be set.

Key split ranges for these split points are as shown below;

UPPER SPLIT POINT = D0 ~ C9 (chromatic)
MIDDLE SPLIT POINT = C#0 ~ B8
LOWER SPLIT POINT = C0 ~ B♭8

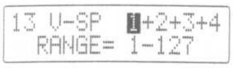
If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which does not contain any keyboard split point — when patches are "layered" without being split — the display appears as in FIG-D.

To input a split point, you must first exit this function (SPLIT POINT) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains a keyboard split point by pressing the VALUE keys.

13 VEL SPLIT

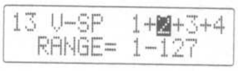
Related Functions

Parameters	**O/S**	EDIT—PAGE—CURSOR—VALUE			
	Domain				
	Mode	**Normal**	**Combination** **4 mix/split**	**Combination** **8 mix**	**Multi channel**
RANGE = 1 ~ 127	K	—	PATCH(Layered)	COUPLE	—
	G		PATCH(Layered)	COUPLE	
	W		PATCH(Layered)	COUPLE	



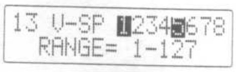
13 V-SP 1+2+3+4
RANGE= 1-127

A



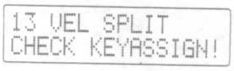
13 V-SP 1+2+3+4
RANGE= 1-127

B



13 V-SP 12345678
RANGE= 1-127

C



13 VEL SPLIT
CHECK KEYASSIGN!

D

The parameters in this function are used to specify VZ-8M "velocity split" characteristics in the Combination Mode. Depending on KEY ASSIGN specifications, between one and four velocity split "ranges" are assigned using these parameters.

By assigning maximum and minimum "velocity" values (1 ~ 127) to each patch in a combined sound, you can create a "velocity range" wherein the specified patch will sound. If velocity message is transmitted at a velocity level that is outside this range, the specified patch will not sound.

Note that this function differs from the "KEYBOARD SPLIT" function, as VEL SPLIT can only be used with KEY ASSIGN configurations containing "layered" (+) patches (such as "1 + 2" or "1 / 3 + 4), as opposed to KEY ASSIGN configurations containing only "split" points (such as "1 / 3" or "1 / 2 / 3 / 4").

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-D.

If you want to use velocity split and no layered patches are specified in the present KEY ASSIGN configuration, you must first exit this function (VEL SPLIT) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches (for example, "1 + 2") by pressing the VALUE keys.

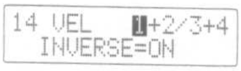
14 VEL INVERSE

Related Functions
VOICE—12

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE
INVERSE = ON / OFF		

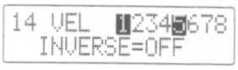
Domain

Mode	Normal	Combination		Multi channel
		4 mix/split	8 mix	
K	—	PATCH(Layered)	COUPLE	—
G		PATCH(Layered)	COUPLE	
W		PATCH(Layered)	COUPLE	



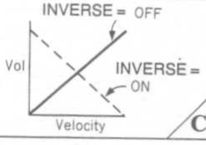
```
14 VEL    1+2/3+4
  INVERSE=ON
```

A

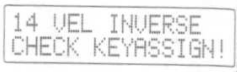


```
14 VEL   12345678
  INVERSE=OFF
```

B



C



```
14 VEL INVERSE
CHECK KEYASSIGN!
```

D

The parameters in this function let you choose whether you want to literally "invert" the velocity level curves created in VOICE-12 for each patch in a combined sound. Depending on KEY ASSIGN specifications, between two and four toggles are contained in this function, which turn the INVERSE function On or Off for each patch in the combined sound.

By "inverting" the VELOCITY LEVEL curve for any given patch, the velocity characteristics are actually "inverted" so that modules in a patch previously "triggered" only by receiving a fairly high velocity rate message (strong external keyboard attack) are turned OFF by a high velocity rate. In other words, the velocity characteristics for the selected patch is virtually reversed, as illustrated in FIG-C.

Note that this function is similar to the VEL SPLIT function, as it can only be used with KEY ASSIGN configurations containing "layered" (+) patches (such as "1 + 2" or "1 / 3 + 4"), as opposed to KEY ASSIGN configurations containing only "split" points (such as "1/3" or "1 / 2 / 3 / 4").

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-D.

If you want to use the VEL INVERSE function, you must first exit this function (VEL INVERSE) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches by pressing the VALUE keys.

NOTE: In the cases listed below, velocity curves of each module are not inverted — even when the INVERSE function is set to ON;
— When the INT LINE is set to PHASE for any particular LINE.
— When EXT PHASE is specified for a particular LINE.

15 POS CROSSFADE

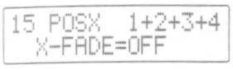
Related Functions

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

X-FADE = ON/OFF
POS = C0 ~ C9

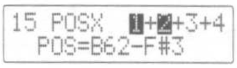
Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	—	PATCH(Layered)	—	—
G		PATCH(Layered)	—	
W		PATCH(Layered)	—	



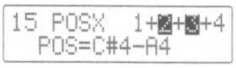
```
15 POSX  1+2+3+4
 X-FADE=OFF
```

A



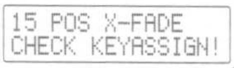
```
15 POSX  1+2+3+4
  POS=B62-F#3
```

B



```
15 POSX  1+2+3+4
  POS=C#4-A4
```

C



```
15 POS X-FADE
CHECK KEYASSIGN!
```

D

The POS CROSSFADE function can only be utilized in the Combination Mode, when a KEY ASSIGN configuration containing only "layered" patches is selected (such as "1+2", "3+4" and "1+2+3+4").

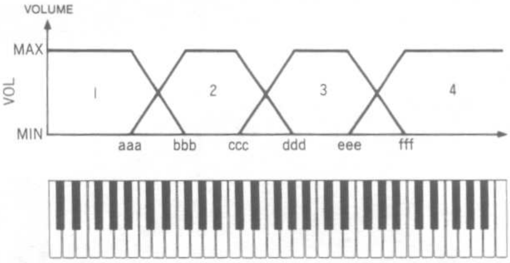
This function is used to "fade" together patches at a certain point on the scale (known as the "cross point"), by determining the range on the external keyboard that wherein the patches will fade together (known as the "cross position" or "POS").

As FIG-E illustrates, in the cross position range (aaa-bbb), one patch becomes progressively more audible, as the other becomes softer and gradually fades out entirely. This creates a "fading" effect, so that there is no audible cutoff point — one patch simply fades into the other as you move up or down the external keyboard.

This function, then, features two basic types of parameters — an EFFECT toggle, which is used to turn the CROSSFADE effect ON or OFF, and POS range settings for each CROSS POSITION. Depending on KEY ASSIGN specifications, either one or three POS ranges are set (FIG-B).

Initially, you must set the X-FADE ON/OFF toggle. Once you've set this toggle, press the cursor [▶] key to move to the actually POS settings. When a KEY ASSIGN configuration featuring only layered patches (1+2+3+4, for example) is selected, the display appears as in FIG-B. In this case, there are three cross points. Notice that area numbers 1 and 2 are highlighted. This indicates that the "POINT" parameter is to be set for the "LOWER" cross point. For the MIDDLE cross point, move the cursor so that "2" and "3" are highlighted. Likewise, when 3 & 4 are highlighted, the UPPER cross point can be set.
Notice that when the cursor [▶] is first pressed, the cursor flashes below the lower limit of the cross range for the selected position ([1]+[2]). After setting this position, press it again to set the upper limit of cross range.
Next, simply press the cursor [▶] key once again to move to the next cross position.

FIG-E



If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains keyboard split points or 8 patches mix — as opposed to only "layered" patches, the display appears as in FIG-D.

If you want to use the POSITIONAL CROSSFADE function and a split KEY ASSIGN configuration is selected, you must first exit this function (POSITIONAL CROSSFADE) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains only layered patches by pressing the VALUE keys.

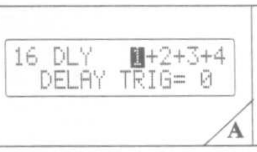
16 DELAY TRIGGER

Related Functions

Parameters	**O/S**	EDIT—PAGE—CURSOR—VALUE
DELAY TRIG = 0 ~ 99		

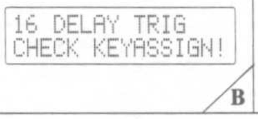
Domain

Mode	**Normal**	**Combination** **4 mix/split**	**Combination** **8 mix**	**Multi channel**
K	—	PATCH(Layered)	—	—
G		PATCH(Layered)	—	
W		PATCH(Layered)	—	



16 DLY ▮+2+3+4
DELAY TRIG= 0

A



16 DELAY TRIG
CHECK KEYASSIGN!

B

The delay trigger function can be used to "delay" the NOTE ON message for any layered patch(es) in a combined sound. Delay time is increased as the DELAY parameter value is raised. At a value of "0", the patch is sounded immediately after Note On message received, while at a value of "99", there is a long delay before the patch sounds.

Note that this function can only be used with KEY ASSIGN configurations containing "layered" (+) patches (such as "1+2" or "1/3+4"), as opposed to KEY ASSIGN configurations containing only "split" points (such as "1/3" or "1/2/3/4") and 8 patch-mix ("1 2 3 4 5 6 7 8").

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-B.

If you want to use the DELAY TRIGGER function and a KEY assign function is selected which contains only split patches (such as 1/3), or when an 8-patch mix is selected, you must first exit this function by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches by pressing the VALUE keys.

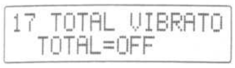
17 TOTAL VIBRATO

Related Functions
VOICE—07

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE
TOTAL = ON/OFF		

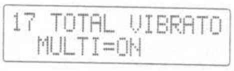
Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	—	PATCH(Layered)	GLOBAL	—
G		PATCH(Layered)	GLOBAL	
W		PATCH(Layered)	GLOBAL	



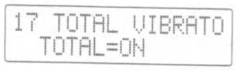
```
17 TOTAL VIBRATO
  TOTAL=OFF
```

A



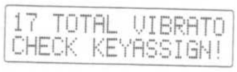
```
17 TOTAL VIBRATO
   MULTI=ON
```

B



```
17 TOTAL VIBRATO
  TOTAL=ON
```

C



```
17 TOTAL VIBRATO
CHECK KEYASSIGN!
```

D

The TOTAL VIBRATO function is a toggle switch which can be used to turn the TOTAL VIBRATO function ON or OFF, and contains parameters related to total-vibrato control.
When this function is turned OFF, patches are affected by the data programmed individually in VOICE-07 (VIBRATO function). When set to ON, COMBI sounds are affected globally — regardless of independent VOICE-07 settings.

There are five basic parameters within this function — WAVE, DEPTH, RATE, DELAY and MULTI. These correspond to the parameters in VOICE-07 (VIBRATO function). For details on operations, see page 32.

Note that when an 8-patch MIX is selected with the KEY ASSIGN function, the TOTAL parameter is automatically turned ON.

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-D.

If you want to use the TOTAL VIBRATO function when this display appears, you must first exit this function (TOTAL VIBRATO) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches ("1 + 2", for example) by pressing the VALUE key.

18

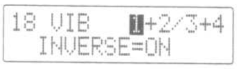
VIBRATO INVERSE

Related Functions
VOICE—07

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE
INVERSE = ON / OFF		

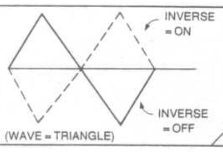
Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	—	PATCH(Layered)	PATCH	—
G		PATCH(Layered)	PATCH	
W		PATCH(Layered)	PATCH	

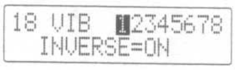


```
18 VIB  1+2/3+4
  INVERSE=ON
```

A

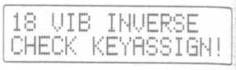


B



```
18 VIB  12345678
  INVERSE=ON
```

C



```
18 VIB INVERSE
CHECK KEYASSIGN!
```

D

The parameters in this function let you choose whether you want to literally "invert" the phase of the vibrato effect for each patch in a combined sound. Depending on KEY ASSIGN specifications, between two, four and eight toggles are contained in this function, which turn the INVERSE function On or Off for each patch in the combined sound.

By "inverting" the vibrato phase for any given patch, the vibrato characteristics are actually reversed, so the vibrato "cycle" becomes "inverted." In other words, by inverting the vibrato phase, the pitch will rise in the part of the vibrato cycle where it would normally fall, and fall where it would normally rise, as illustrated in FIG-B.

As with the DELAY TRIGGER function, this function can only be used with KEY ASSIGN configurations containing "layered" (+) patches (such as "1 + 2" or "1 / 3 + 4"), as opposed to KEY ASSIGN configurations containing only "split" points (such as "1 / 3" or "1 / 2 / 3 / 4").
Note that this function can, however, be used when an 8-patch mix configuration (1 + 2 + 3 + 4 + 5 + 6 + 7 + 8) is selected. (FIG-C)

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-D.

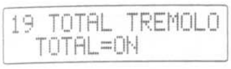
If you want to use the VIB INVERSE function when this display appears, you must first exit this function (VIB INVERSE) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches ("1 + 2", for example) by pressing the VALUE keys.

19 TOTAL TREMOLO

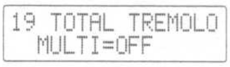
Related Functions
VOICE—13

O/S EDIT—PAGE—CURSOR—VALUE

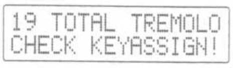
Parameters	Domain				
	Mode	**Normal**	**Combination** 4 mix/split	**Combination** 8 mix	**Multi channel**
TOTAL = ON / OFF	K	—	PATCH(Layered)	GLOBAL	—
	G		PATCH(Layered)	GLOBAL	
	W		PATCH(Layered)	GLOBAL	


19 TOTAL TREMOLO
TOTAL=ON

A


19 TOTAL TREMOLO
MULTI=OFF

B


19 TOTAL TREMOLO
CHECK KEYASSIGN!

C

The TOTAL TREMOLO function is a toggle switch which can be used to turn the TOTAL TREMOLO function ON or OFF, and contains parameters related to total-vibrato control.
When this function is turned OFF, patches are affected by the data programmed individually in VOICE-13 (TREMOLO function). When set to ON, COMBI sounds are affected globally — regardless of independent VOICE-13 settings.

There are five basic parameters within this function — WAVE, DEPTH, RATE, DELAY and MULTI. These correspond to the parameters in VOICE-13 (TREMOLO function). For details on operations, see page 38.

Note that when an 8-patch MIX is selected with the KEY ASSIGN function, the TOTAL parameter is automatically turned ON.

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-C.

If you want to use the TOTAL TREMOLO function when this display appears, you must first exit this function (TOTAL TREMOLO) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches ("1 + 2", for example) by pressing the VALUE key.

20 TREMOLO INVERSE

Related Functions
VOICE—13

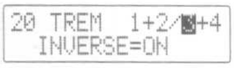
Parameters

INVERSE = ON / OFF

O/S EDIT—PAGE—CURSOR—VALUE

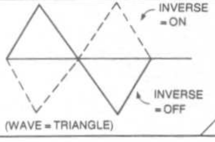
Domain

Mode	Normal	Combination 4 mix/split	 8 mix	Multi channel
K	—	PATCH(Layered)	PATCH	—
G		PATCH(Layered)	PATCH	
W		PATCH(Layered)	PATCH	

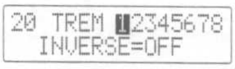


```
20 TREM  1+2/3+4
  INVERSE=ON
```

A

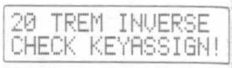


B



```
20 TREM 12345678
  INVERSE=OFF
```

C



```
20 TREM INVERSE
CHECK KEYASSIGN!
```

D

The parameters in this function let you choose whether you want to literally "invert" the phase of the tremolo effect for each patch in a combined sound. Depending on KEY ASSIGN specifications, between two, four and eight toggles are contained in this function, which turn the INVERSE function On or Off for each patch in the combined sound.

By "inverting" the tremolo phase for any given patch, the tremolo characteristics are actually reversed, so the tremolo "cycle" becomes "inverted." In other words, by inverting the tremolo phase, the volume will rise in the part of the tremolo cycle where it would normally fall, and fall where it would normally rise, as illustrated in FIG-B.

Note that this function is similar to the VIB INVERSE function, as it can only be used with KEY ASSIGN configurations containing "layered" (+) patches (such as "1+2" or "1/3+4"), as opposed to KEY ASSIGN configurations containing only "split" points (such as "1/3" or "1/2/3/4"). Note that this function can, however, be used when an 8-patch mix configuration (1+2+3+4+5+6+7+8) is selected. (FIG-C)

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-D.

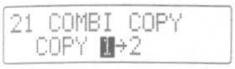
If you want to use the TREMOLO INVERSE function and this display appears, you must first exit this function by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches by pressing the VALUE keys.

21 COMBI COPY

Related Functions
EFFECT—01~07, 10, 11, 13,
14, 16, 18, 20

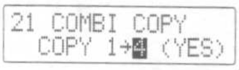
Parameters	**O/S**	EDIT—PAGE—CURSOR—VALUE
COPY = 1~8→1~8		

Domain			
Mode	**Normal**	**Combination** **4 mix/split 8 mix**	**Multi channel**
K	—	PATCH	—
G		PATCH	
W		PATCH	



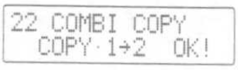
```
21 COMBI COPY
  COPY █→2
```

A



```
21 COMBI COPY
  COPY 1→█ (YES)
```

B



```
22 COMBI COPY
  COPY·1→2  OK!
```

C

The COMBI COPY function can be used to "copy" the EFFECT menu data of one patch in a combination to another patch position.

For example, the patch number and effect data (EFFECT-01~20) assigned to the Patch 1 position can be copied into any of the 3 or 7 remaining positions by using this function.

Copying can be executed by simply specifying the "source" patch number (FIG-A), and the patch number of the "destination" patch by moving the cursor to the right and pressing a PROG NO key (A1~H8) (FIG-B). After this, just press the YES key (FIG-C).

Data which is copied includes the source patch timbre, and all effect data specified using EFFECT menu functions 01 through 20, with the exception of 8, 9, 12, 15, 17 and 19.

The following data is copied using COMBI COPY function (universal for K, G and W performance modes).

KEY ASSIGN MENU	1~4	including 5~8
00 MIDI CH	—	—
01 PORTAMENTO/SOLO	○	—
02 PITCH BEND	○	—
03 AFTER TOUCH	○	○
04 DEF CONTROL	○	—
05 MOD WHEEL	○	—
06 FOOT VR	○	—
07 FOOT SW	○	—
08 VEL TABLE SELECT	—	—
09 PAN	—	—
10 LEVEL	○	○
11 PITCH	○	○
12 SPLIT POINT	—	—
13 VEL SPLIT	○	—
14 VEL INV	○	—
15 POS X FADE	—	—
16 DELAY TRIG	○	—
17 TOTAL VIBRATO	—	—
18 VIB INV	○	○
19 TOTAL TREMOLO	—	—
20 TREMOLO INV	○	○
Program number	○	○

Setting example	
1 → 3	2 → 8
4 → 2	5 → 7
	5 → 4

"○" indicates that data is copied.

00 OPERATION NAME

Related Functions

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE	
Alphabet = A ~ Z Numeral = 0 ~ 9 Marks = “. ”, “–”, “/”		**Domain**	
		Mode	**Operation memory**
		Keyboard	1 Set-up
		Guitar	
		Wind	

```
00 OP NAME  INT
A-1:
```

A

This function is used to assign a name to the VZ-8M's Operation Memories.

The names you choose may contain both letters and numbers, and may be up to 12 characters in length.

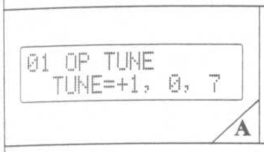
Character input is carried out using the VALUE keys, with alphanumeric characters and marks being displayed cyclically by holding either VALUE key down. The procedure is the same as for VOICE-20 (“VOICE NAME”).

Note that this function can only be accessed when OPERATION MEMORY is selected.

01 OPERATION TUNE

Related Functions
TOTAL—00

<table>
<tr><th rowspan="3">Parameters</th><th>O/S</th><th colspan="2">EDIT—PAGE—CURSOR—VALUE</th></tr>
<tr><th colspan="3">Domain</th></tr>
<tr><th colspan="2">Mode</th><th>Operation memory</th></tr>
<tr><td rowspan="3">TUNE= +/− (POLARITY),
0∼5 (OCTAVE),
0∼11 (NOTE),
0∼63 (FINE)</td><td colspan="2">Keyboard</td><td rowspan="3">1 Set-up</td></tr>
<tr><td colspan="2">Guitar</td></tr>
<tr><td colspan="2">Wind</td></tr>
</table>



```
01 OP TUNE
  TUNE=+1, 0, 7
```

The parameters in this function can be used to set or alter the pitch of each operation memory.
Naturally, this function can only be accessed after entering the OPERATION MEMORY Mode.

By setting this parameter, it becomes possible to perform using the pitch set for the selected operation memory.

The TUNE parameter consists of 4 basic data items. First of all, the cursor flashes under the POLARITY parameter. To set the other parameters, simply move the cursor.

The POLARITY parameter is used to specify whether pitch will be raised (+) or lowered (−).

The OCTAVE parameter is used to raise or lower the pitch by a maximum of 5 octaves, in 1-octave increments.

The NOTE parameter is used to raise or lower the pitch of the selected AREA by a maximum of 1100 cents, in 100-cent increments.

The FINE parameter is used to make "fine tuning" adjustments in 1.6-cent increments (approximate).

The actual pitch used in performance is raised or lowered according to the values set using this function, using the pitch set in the MASTER TUNE function (TOTAL CONTROL-00) as a basis.

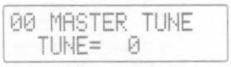
00, 01 MASTER TUNE/TRANSPOSE

Related Functions

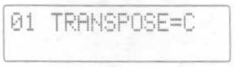
Parameters	O/S	EDIT—PAGE—CURSOR—VALUE
TUNE = −64 ~ 0 ~ +64 TRANSPOSE = G ~ F#		

Domain

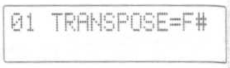
Mode	Normal	Combination 4 mix/split	Combination 8 mix	Operation memory	Multi channel
K	GLOBAL				
G					
W					


```
00 MASTER TUNE
  TUNE=  0
```

A


```
01 TRANSPOSE=C
```

B


```
01 TRANSPOSE=F#
```

The parameters in this function can be used to set the overall "tuning", as well as alter the standard key by using a built-in TRANSPOSE function.

The TUNE parameter allows you to set the standard A4 tuning within a range of 417.2 and 468.3 Hz (+/−100 cents from standard), in approximately 1.6-cent increments. (This setting is approximate — use it only as a guide.) The initialized value for this parameter is "0". (FIG-A)

The TUNE parameter can be reset to its initialized value ("0") by pressing both VALUE keys simultaneously.

The TRANSPOSE parameter lets you "transpose" the standard pitch frequency to other key positions. In other words, the pitch that would normally correspond to C can be "shifted" chromatically to another key, within a range of G to F#. This effectually transposes the overall performance key.

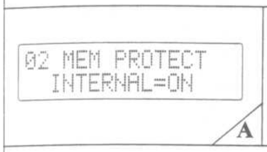
02 MEMORY PROTECT

Related Functions
· TOTAL—03, 06

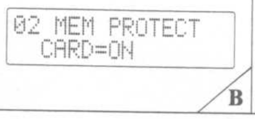
Parameters	O/S	EDIT—PAGE—CURSOR—VALUE
INTERNAL = ON / OFF CARD = ON / OFF		

Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Operation memory	Multi channel
K	GLOBAL				
G					
W					


02 MEM PROTECT
INTERNAL=ON

A


02 MEM PROTECT
CARD=ON

B

The parameters in this function can be used to protect the memory, so that data cannot be altered or erased.

The INTERNAL parameter features a toggle which can be turned ON or OFF. When set to ON, the contents of the internal and operation memories will be protected.

The CARD parameter also features a toggle which can be turned ON or OFF. When set to ON, the contents of sound and operation memories on the RAM cards will be protected.

Both parameters are automatically set to "ON" each time the unit's power is turned ON.

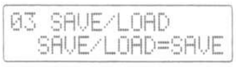
03 SAVE/LOAD

Related Functions

Parameters	**O/S**	EDIT—PAGE—CURSOR—VALUE

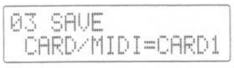
SAVE/LOAD = SAVE/LOAD
CARD/MIDI = CARD 1/CARD 2/MIDI
DATA = VOICE/OPMEM/VC + OP/FULL

Domain					
Mode	**Normal**	**Combination 4 mix/split**	**8 mix**	**Operation memory**	**Multi channe**
K	GLOBAL				
G					
W					



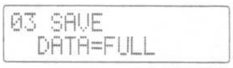
03 SAVE/LOAD
SAVE/LOAD=SAVE

A



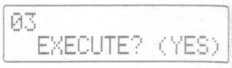
03 SAVE
CARD/MIDI=CARD1

B



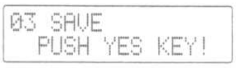
03 SAVE
DATA=FULL

C



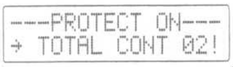
03
EXECUTE? (YES)

D



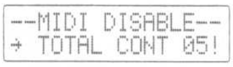
03 SAVE
PUSH YES KEY!

E



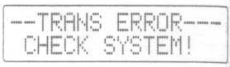
---PROTECT ON---
→ TOTAL CONT 02!

F



--MIDI DISABLE--
→ TOTAL CONT 05!

G



--TRANS ERROR---
CHECK SYSTEM!

H

This function is essentially a "utility" function, which is used to control data SAVE and LOAD operations.

The SAVE/LOAD parameter is used to specify the type of operation you want to perform. When SAVE is selected, the onboard memory data will be "saved" to an external memory medium, while when LOAD is selected, external data will be "loaded" into the onboard memory.

The CARD 1/CARD 2/MIDI parameter lets you choose the medium to/from which you will SAVE or LOAD data.

When CARD is selected, data will either be saved to, or loaded from a RAM/ROM card inserted in the card slot. If you want to SAVE the data, be sure to also set the CARD parameter to "CARD 1". When MIDI is selected, data will be transferred to or from another VZ series synthesizer.
When using a new RAM card, you must first format it (see TOTAL-06).

The DATA parameter lets you choose the type or combination of data which will be saved or loaded. You can choose from three different settings — VOICE, OP MEM or VC + OP. Note, however, that when using two VZ units connected by MIDI, this setting must be the same for both units (except when executing SAVE or LOAD).

When "VOICE" is selected, all 64 internal sounds can be transferred to or from the internal memory. When "OP MEM" is selected, only data from the 64 operation memories can be transferred to or from the unit.

When "VC + OP" is selected, data from both the 64 internal sounds and the 64 operation memories can be transferred.

When "FULL" is selected, data from the "VC + OP" parameter and TOTAL CONTROL menu functions 00, 01, 04 and 05 can be transferred to or from the unit.

Once you've specified the operation you want to perform, press the YES key. Respond to the menu prompt by pressing the YES key once again.

If you want to abort data transmission, simply press the cursor or NO (VALUE ▼) key of the transmitting or receiving device.

Note that when an Operation Memory featuring INTERNAL sounds is SAVED to a card, the sound specification on the display automatically changes to "CARD" for the formerly INTERNAL sounds.

Note that if the memory protect is set to ON (TOTAL-02), it will be impossible to LOAD data. (FIG-F)

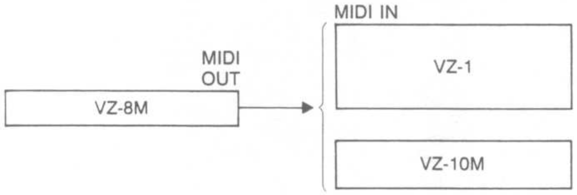
Note that if MIDI Exclusive is disabled (TOTAL-04) or basic channels do not match, MIDI SAVE/LOAD will be impossible.

If data is not transferred successfully for some reason, MIDI SAVE/LOAD will be impossible and display appears as in FIG-H.

If an ERROR message appears, operations can be reset by pressing the MODE, PAGE or CURSOR keys.

VZ-8M Compatibility with VZ-1/VZ-10M

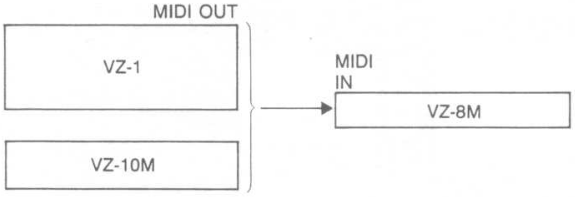
When transferring data between the VZ-8M and the VZ-1 or VZ-10M with the VZ-8M as MASTER, data compatibility is as follows;



DATA — **VOICE:** Totally compatible operation
OP MEM: Compatible within limits of VZ-1 and VZ-10M menu functions.
VC + OP: Treated separately, as listed above.

NOTE: Never attempt to transfer operation memory data which has been sent to the VZ-1 back to the VZ-10M.

When transferring data between the VZ-8M and the VZ-1 or VZ-10M with the VZ-8M as SLAVE, data compatibility is as follows;



DATA — **VOICE:** Totally compatible operation
OP MEM: Compatible within limits of VZ-1 and VZ-10M menu functions. Functions only available on VZ-8M are set at initialized values.
VC + OP: Treated separately, as listed above.

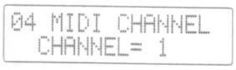
NOTE: The above is true for data saved/loaded using RAM cards as well.

04

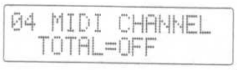
MIDI CHANNEL

Related Functions

<table>
<tr><th>Parameters</th><th>O/S</th><th colspan="4">EDIT—PAGE—CURSOR—VALUE</th></tr>
<tr><td rowspan="5">CHANNEL = 1 ~ 16
TOTAL = ON / OFF</td><th colspan="5">Domain</th></tr>
<tr><th>Mode</th><th>Normal</th><th>Combination
4 mix/split 8 mix</th><th>Operation memory</th><th>Multi channel</th></tr>
<tr><td>K</td><td colspan="4" rowspan="3">GLOBAL</td></tr>
<tr><td>G</td></tr>
<tr><td>W</td></tr>
</table>


04 MIDI CHANNEL
CHANNEL= 1

A


04 MIDI CHANNEL
TOTAL=OFF

B

The MIDI CHANNEL parameter is used to specify the MIDI channel on which the VZ will receive and transmit MIDI messages.

It is possible to program separate MIDI channels for each operational mode (NORMAL, COMBI, OP MEM and MULTI CH). This is accomplished by first selecting the desired mode, and then setting this parameter.

Notice that there are two parameters the "CHANNEL" parameter and the "TOTAL" parameter.

When the TOTAL parameter is set to "ON", the MIDI receive channel in all modes are affected by the channel set in the "CHANNEL" parameter, with the exception of the MULTI CH mode or operation memories using the MULTI CH mode.
To switch between the two parameters, use the cursor keys. The value keys can be used to raise or lower the CHANNEL number and change the TOTAL parameter setting.

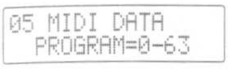
05 MIDI DATA

Related Functions

Parameters

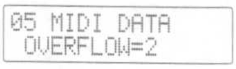
PROGRAM = 0 – 127 / 0 – 63 / DIS
EXCLUSIVE = ENA / DIS
DEF CONTROL = OFF / 12 ~ 31
VOLUME = ENA / DIS
OVERFLOW = NORMAL 1 ~ 8

O/S	EDIT — PAGE — CURSOR — VALUE				
	Domain				
Mode	**Normal**	**Combination** **4 mix/split 8 mix**	**Operation memory**	**Multi channel**
K	GLOBAL			
G				
W				



```
05 MIDI DATA
  PROGRAM=0-63
```

A



```
05 MIDI DATA
 OVERFLOW=2
```

B

The parameters in this function are used to specify a variety of MIDI-related data (with the exception of the MIDI Channel).

The PROGRAM NO parameter lets you choose the MIDI PROGRAM CHANGE message number. Note that messages are distributed as shown in the chart below. You can choose from DIS, 0 ~ 63, and 0 ~ 127 settings with the VALUE controls.

0 ~ 63: The unit receives messages 0 ~ 63 in the selected memory area (PRESET 1, PRESET 2, INTERNAL, CARD 1 or CARD 2).

0 ~ 127: The unit receives messages 0 ~ 63 in INTERNAL areas A1 through H8. 64 ~ 127 are received as CARD 1. However, if INTERNAL is selected on the receiving unit, 64 ~ 127 are received in the memory area which is selected in MIDI EXCLUSIVE function.
When power is turned ON, memory area is set to CARD 1 (set to "INTERNAL" when no card is inserted).

DIS: Program data is not received.

The EXCLUSIVE parameter lets you choose whether or not sound or operation data or multi-channel mode data is transmitted / received according to MIDI System Exclusive messages. When it is set to ENA (enable), MIDI communication can be controlled through these messages.

The DEF CONTROL (control number) parameter is used to specify the Control Change number of messages controlled by MIDI Control change No. 12 ~ 31 messages (see EFFECT-05 "DEF CONTROL"). When set to OFF, MIDI OUT / IN messages are not transmitted.

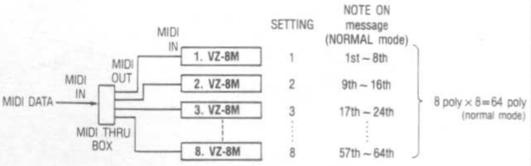
The VOLUME parameter can be used to specify whether or not the unit will transmit and receive MIDI Volume messages (control change 07). When set to ENA (enable), the Master volume level can be controlled by MIDI messages from an external device. When set to DIS (disable), the Master volume is independent of external control.
In addition, MIDI Volume messages are not output when set to DIS.

A Channel on which Master volume data is received in respective performance modes is shown below.

performance mode	channel received
K/W mode	Channel which receives NOTE ON.
G mode	Primary channel which receives NOTE ON.
MULTI CH mode (including Operation memory with MULTI CH)	Channel set in TOTAL-04 "MIDI CH" function.

Overflow Mode — NORMAL 1 ~ 8

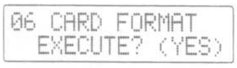
The overflow mode allows programming so that no sound is produced until a specific MIDI IN NOTE ON message number is received. When set to NORMAL, sound is produced from the reception of the first NOTE ON message, with the last note played having priority.
When the OVERFLOW MODE is set to "1", sound is also produced from the reception of the first NOTE ON message, with the note previously played having priority.
When set to "2", sound is produced only from the reception of the first NOTE ON message which exceeds the polyphonic limit of the device presently sounding.
When set to "3", sound is produced only from the reception of the first NOTE ON message which exceeds a value which is twice the polyphonic limit of the device presently sounding.
In this way, multiple VZ-8M's can be linked to create up to 64-note polyphony, with the first VZ-8M covering NOTE ON messages 1 through 8, the second covering messages 9 through 16, etc., as shown below.
NOTE: The settings (MODE, operation data and voice data etc.) must be the same for all VZ-8M units when used in this configuration.



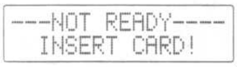
06 CARD FORMAT

Related Functions
TOTAL—01

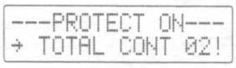
<table>
<tr><th rowspan="2">Parameters</th><th>O/S</th><th colspan="5">EDIT—PAGE—CURSOR—VALUE</th></tr>
<tr><th colspan="6">Domain</th></tr>
<tr><td rowspan="4">EXECUTE? (YES)
PUSH YES KEY</td><td>Mode</td><td>Normal</td><td>Combination
4 mix/split 8 mix</td><td>Operation memory</td><td>Multi channe</td></tr>
<tr><td>K</td><td colspan="4" rowspan="3">GLOBAL</td></tr>
<tr><td>G</td></tr>
<tr><td>W</td></tr>
</table>


06 CARD FORMAT
EXECUTE? (YES)

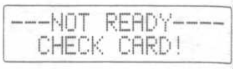
A


---NOT READY----
INSERT CARD!

B


---PROTECT ON---
→ TOTAL CONT 02!

C


---NOT READY----
CHECK CARD!

D

This is a utility function which is used to "FORMAT" the accessory RAM card. Before you can store information in RAM cards, you must "initialize" them into a format that the VZ understands.

By executing the FORMAT command, all former contents are erased from the card, and it is prepared to receive fresh sound data. When the RAM card is formatted, it is automatically programmed with the 64 preset (1) patches and 64 preset (1) operation memories.

After inserting the card you want to format in to the card slot, you simply access this function's EXECUTE parameter. A "YES?" prompt will appear on the display (FIG-A). To execute formatting, press the YES key.

If you try to execute formatting without first inserting a RAM card, the display will appear as in FIG-B. First insert the card and try again!

If you try to execute formatting when the memory protect function (TOTAL-02) is ON, the display will appear as in FIG-C. First turn this function OFF, and try again!

If you try to execute formatting when an optional ROM (not "RAM" but "ROM") card is inserted in the card slot, the display will appear as in FIG-D. There is no need to format ROM cards.

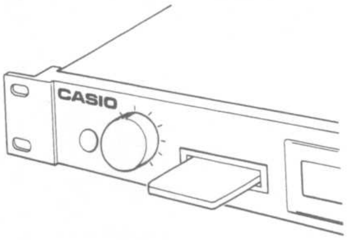
To abort execution of this function, press the MODE key or PAGE key.

Performance/Editing in the Normal Mode

To select sounds for performance in the normal mode

①Press the NORMAL mode key.

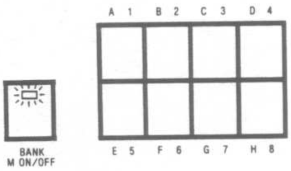
②If you want to choose a **PRESET** or an **INTERNAL** patch, select by using the SHIFT key.



If you want to choose a **CARD** patch, first insert the RAM or ROM card in the card slot and then select by using the SHIFT key.

Each bank holds up to 64 patches and 64 operation memories.

When using a new RAM card, you must first format it (see TOTAL-06). A formatted RAM card is capable of storing up to 64 patches and 64 operation memories.



③Select the patch you want to play.
In order to change the BANK, first press the BANK key (indicator lights). Next press the PROG NO key corresponding to the BANK "letter" you want to choose. (For example, the "B2" key corresponds to the "B" bank.) Notice that the BANK key indicator goes out as soon as you select a bank.
Finally, select the voice number by pressing a PROG NO key once again. In this case, the keys correspond to the numbers digit. (For example, the "B2" key would now correspond to voice number "2".)

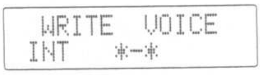
④Select the performance mode (Keyboard, Guitar or Wind) by pressing the value keys.

To write a single patch to memory

①Select the patch you want to write to memory (preset, internal or card patch or Compare/Recall ON/OFF) and select one of the performance modes (K, G, W).

WRITE
COPY/INIT

②Hold down the WRITE key.



WRITE VOICE
INT *-*

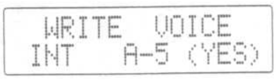
The LCD appears as shown at the right, and the INTERNAL/CARD indicators go out. If you release the WRITE key, the LCD will return to its normal status.

COMPARE/
RECALL

If you've used the COMPARE/RECALL function when editing a patch using VOICE PARAMETER menu functions, be sure that the COMPARE/RECALL indicator is ON. If it is OFF, press the COMPARE/RECALL key.

If the COMPARE/RECALL key is pressed in the NORMAL play sub-mode, the EDIT key indicator also comes ON. If you want to enter the play sub-mode once again to write sounds to memory, you must first press either the NORMAL key or EDIT key so that the EDIT key indicator goes out.

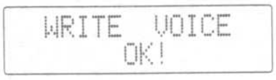
③While still holding down the WRITE key, select the memory to which you want to write the patch. This is accomplished by pressing the SHIFT key and PROG NO keys. Next, press the YES key.



```
WRITE  VOICE
INT   A-5 (YES)
```

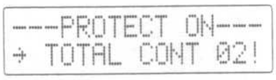
When using the PROG NO keys, first press a key corresponding to the bank (A1 key for "A" bank, for example) and then press a key corresponding to the voice number (F6 key for "6", for example).

When writing is completed successfully, an "OK!" message appears on the display.



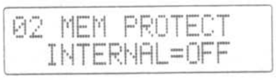
```
WRITE  VOICE
     OK!
```

If the memory protect function (TOTAL-02) is ON, writing will be impossible. In this case, you must first turn the protect function OFF by accessing TOTAL-02, reenter the PLAY mode and perform write operations again.



```
---PROTECT ON---
→ TOTAL CONT 02!
```

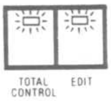
For information on writing patch data to the OPERATION MEMORY, see "Performance/Editing in the Operation Memory Mode."



```
02 MEM PROTECT
  INTERNAL=OFF
```

To edit a single patch

To edit a single patch in the NORMAL mode, simply press the MENU selector (EDIT/PAGE key or TOTAL CONTROL key) corresponding to the function which you want to edit, and access the function. For further data on MENUs, FUNCTIONs and PARAMETERs, refer to " Operating System Controls".

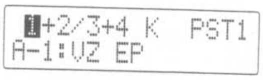


Performance/Editing in the Combination Mode

To specify KEY ASSIGN configurations

①After entering the Combination PLAY sub-mode, you can select from one of 8 different "KEY ASSIGN" configurations by pressing the VALUE keys. When the VALUE keys are pressed, key assign configurations change cyclically.

COMBI-
NATION



KEY ASSIGN CONFIGURATIONS

( ) .... polyphonic

DISPLAY \ OUT		MIX OUTPUT	LINE OUT***	
			1	2
1+2	*	1+2	1 (4)	2 (4)
3+4	*	3+4	3 (4)	4 (4)
1+2+3+4	**	1+2+3+4	1+2 (2)	3+4 (2)
1/3		1/3	1 (4)	3 (4)
1/3+4		1/3+4	1 (4)	3+4 (2)
1+2/3		1+2/3	1+2 (2)	3 (4)
1+2/3+4		1+2/3+4	1+2 (2)	3+4 (2)
1/2/3/4		1/2/3/4	1 / 2 (2/2)	3 / 4 (2/2)
12345678		1+2+3+4+5+6+7+8	1+2+3+4 (1)	5+6+7+8 (1)

* Note that when cross-fade is used, each sound features 4-note polyphony and you can use as many as 8 notes simultaneously.

** Note that when cross-fade is used, each sound features 2-note polyphony and you can use as many as 8 notes simultaneously.

*** LINE OUT 1/2 is set for the time being according to EFFECT-09 setting.

To select patches in a combined sound

①After entering the Combination PLAY sub-mode, move the CURSOR to any patch position.

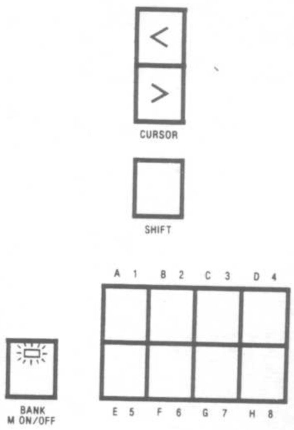
②In order to choose a PRESET or INTERNAL patch, you must first press the SHIFT key.

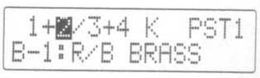
If you want to choose a **CARD** patch, first insert the RAM or ROM card in the card slot and then select by using the SHIFT key.

③Select the patch you want to play.

In order to change the BANK, first press the BANK key (indicator lights). Next press the PROG NO key corresponding to the BANK "letter" you want to choose. (For example, the "B2" key corresponds to the "B" bank.) Notice that the BANK key indicator goes out as soon as you select a bank.
Finally, select the voice number by pressing a PROG NO key once again. In this case, the keys correspond to the numbers digit. (For example, the "A1" key would now correspond to voice number "1".)

You can view the patch name by moving the KEY ASSIGN position using the cursor keys.





④Move the cursor to the right to select the performance mode (Keyboard, Guitar or Wind). Performance mode can be selected by pressing the VALUE keys.

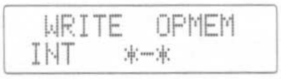
To write Combination data to the OPERATION MEMORY

①Select the COMBINATION mode and edit your combined sound until you are satisfied. Then press the COMBINATION key to enter the PLAY sub-mode and select one of the performance modes (K, G, W).

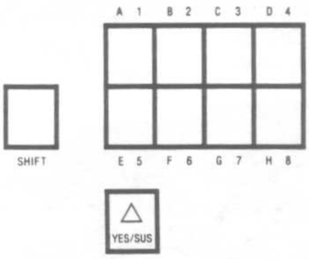
COMBI-
NATION

②Hold down the WRITE key.

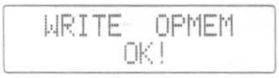
WRITE
COPY/INIT


WRITE OPMEM
INT *-*

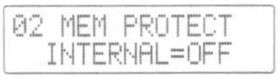
③While still holding down the WRITE key, select the memory to which you want to write the patch (the SHIFT key, followed by PROG NO keys), then, press the YES key.



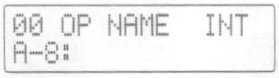
When writing is completed successfully, an "OK!" message appears on the display.


WRITE OPMEM
OK!

If the memory protect function (TOTAL-02) is ON, writing will be impossible. In this case, you must first turn the protect function OFF by accessing TOTAL-02, reenter the PLAY mode and perform write operations again. Also, it is impossible to write to the Operation Memory when the COMPARE/RECALL function is ON, regardless of the selected key assign setting. For example, if COMPARE/RECALL function is set to ON for key assignment "3+4", it will be impossible to write when 1+2 is selected as well. If "C/R ON CHECK VOICE NO.!" messages are displayed, be sure to turn the COMPARE/RECALL function OFF for all patches.
Note that writing to the operation memory must be performed in the PLAY sub-mode.


02 MEM PROTECT
INTERNAL=OFF

④Once you've completed writing combined sound data to the operation memory, you can give it a name by using the OPERATION NAME function in OPE EFFECT-00. (After assigning a name, you must rewrite the sound again to the Operation Memory.)


00 OP NAME INT
A-8:

Performance/Editing in the Operation Memory Mode

The OPERATION MEMORY mode can be used to store effect and sound data from up to 64 sounds (patches or combined sounds) from the VZ-8M internal memory or card memory.

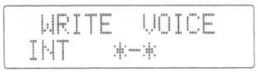
To copy data from the Normal Mode memory into the Operation Memory

①After entering the Normal Mode, select the Play sub-mode by pressing the NORMAL key.

②Select the patch you want to use, as well as the desired performance mode (K, G, or W).

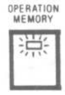
③Hold down the WRITE key. The display appears as shown on the right.

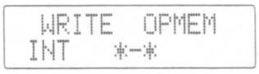
WRITE
COPY/INIT



WRITE VOICE
INT *-*

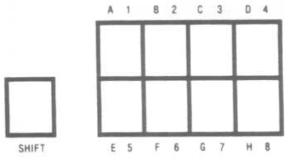
④Press the OPERATION MEMORY key.



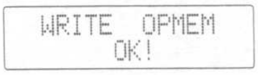


WRITE OPMEM
INT *-*

⑤While still holding down the WRITE key, select the patch you want to WRITE by first pressing the SHIFT key, and then pressing the PROG NO key. Finally, press the YES key.

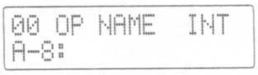


When writing is completed successfully, an "OK !" message appears on the display.



WRITE OPMEM
OK!

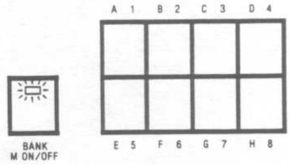
⑥Once you've completed writing combined sound data to the operation memory, you can give it a name by using the OPERATION NAME function in OPE EFFECT-00. (After assigning a name, you must re-write the sound again to the Operation Memory. The OPERATION NAME function can only be set while in the OPERATION MEMORY mode.)



00 OP NAME INT
A-8:

To write operation memory data from one operation memory to another

①After entering the Operation Memory Mode, select the operation you want to transfer by pressing the BANK key and a PROG NO key.

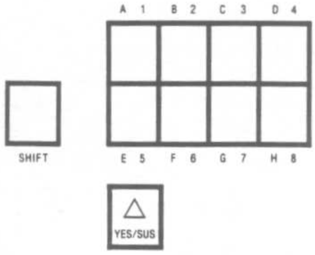


②Hold down the WRITE key.

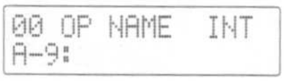
WRITE
COPY/INIT

③Select the operation memory you want to transfer the selected operation memory to by pressing the PROG NO keys, then, press the YES key.

When writing is completed successfully, an "OK !" message appears on the display.

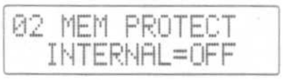


④Once you've completed transferring the operation memory data, you can give it another name by using the OPERATION NAME function in OPE EFFECT-00. (After assigning a name, you must re-write the sound again to the Operation Memory).



00 OP NAME INT
A-9:

If the memory protect function (TOTAL-02) is ON, writing will be impossible. In this case, you must first turn the protect function OFF by accessing TOTAL-02, reenter the PLAY mode and perform write operations again.



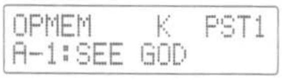
02 MEM PROTECT
INTERNAL=OFF

Note that writing to the operation memory must be performed in the PLAY sub-mode.

To edit sound, effect data and MIDI setting data you've already written, preset sounds or sounds from RAM or ROM cards

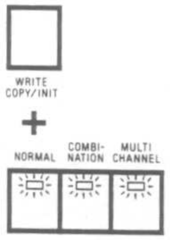
You must first move the sounds of the selected Operation Memory back to the COMBINATION, NORMAL or MULTI CH MODE memory.

①While in the Operation Memory mode, select the patch that you wish to edit.



OPMEM   K PST1
A-1:SEE GOD

②Hold down the WRITE key and press the COMBINATION key, NORMAL key or MULTI CH key (whichever indicator is lit).



This will write the Operation back into the combination buffer so you can access all of the functions (except for OPE EFFECT-00 and 01) to re-edit your combination or normal sound — months or even years after you originally created it!

③When you've finished editing the sound, re-write it using normal write operations.

Performance/Editing in the Multi Channel Mode

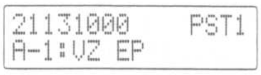
The Multi channel mode can be used to receive or send through up to 8 MIDI channels.
This MULTI CHANNEL mode differs from the normal MIDI Performance MODEs (MIDI mode 4 (OMNI/OFF, MONO), etc.).

MULTI
CHANNEL

To assign a patch to a specific AREA

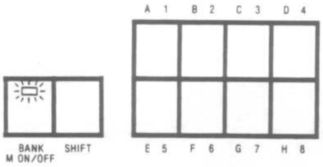
①After entering the Multi Channel mode by pressing the Multi Channel key, specify the AREA in which you want to assign a patch by pressing the cursor and VALUE keys.

Note there are 8 digits at the top left-hand corner of the display. These digits correspond to memory AREAs 1 through 8, from left to right. The value of each digit indicates the polyphony of the corresponding area. Note that as the VZ-8M features 8-note polyphonic performance, the sum of these digits can be no higher than 8.



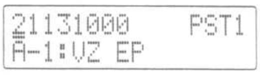
```
21131000      PST1
A-1:VZ EP
```

②Specify the patch to be assigned by pressing the SHIFT key, the BANK key and the PROG NO key.



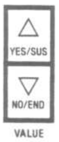
To specify polyphony for a specific AREA

①After entering the Multi Channel mode by pressing the Multi Channel key, specify the AREA in which you want to specify polyphony by pressing the cursor keys.



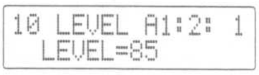
```
21131000      PST1
A-1:VZ EP
```

②Specify polyphony for the selected AREA with the value controls. (Note that if this value does not change, you may have to lower the polyphony level for another area, as the maximum sum polyphony totals 8 notes for AREA 1～8.)



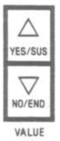
To alter volume level for a specific AREA

①After entering the Multi Channel mode by pressing the Multi Channel key, specify the AREA for which you want to alter the output volume level by accessing EFFECT-10.



```
10 LEVEL A1:2: 1
   LEVEL=85
```

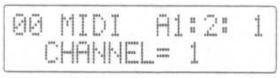
②Lower or raise the relative volume level with the value controls. (Note that at a maximum level of "99," the volume is equal to that as controlled with the master volume on the front panel.)



To specify a MIDI channel for a specific AREA

①After entering the Multi Channel mode by pressing the Multi Channel key, specify the AREA for which you want to set the MIDI channel number by accessing EFFECT-00.

②Specify the MIDI channel with the value controls.

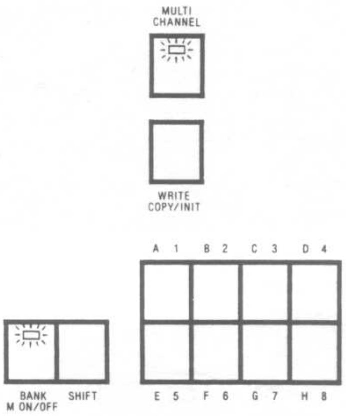


```
00 MIDI   A1:2: 1
  CHANNEL= 1
```

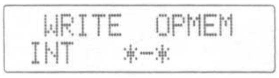
Note that these settings are made for each AREA individually. You can change the selected AREA number at any point in editing by pressing the Multi Area keys.

To write MULTI CH data to the OPERATION MEMORY

①Select the MULTI CH mode and edit multi-channel data until you are satisfied. When you're finished editing, press the MULTI CH mode key to enter the PLAY mode.

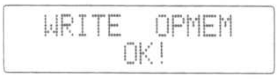


②Hold down the WRITE key.



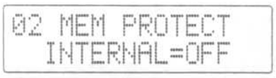
```
  WRITE  OPMEM
 INT    *-*
```

③While holding down the WRITE key, select the memory to which you want to write the patch (SHIFT key, followed by PROG NO keys A1 ~ H8). Then, press the YES key.
When writing is completed successfully, an "OK!" message appears on the display.



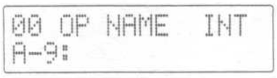
```
  WRITE  OPMEM
        OK!
```

If the memory protect function (TOTAL-02) is ON, writing will be impossible. In this case, you must first turn the protect function OFF by accessing TOTAL-02, reenter the PLAY mode and perform write operations again.



```
02 MEM PROTECT
  INTERNAL=OFF
```

④Once you've completed writing the MULTI CH data to the operation memory, you can give it a name by using the OPERATION NAME function (OPE EFFECT-00). After assigning a name you must re-write the data again to the Operation Memory.

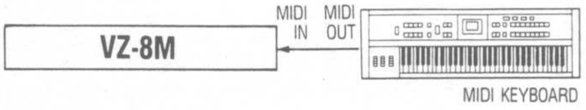


```
00 OP NAME   INT
A-9:
```

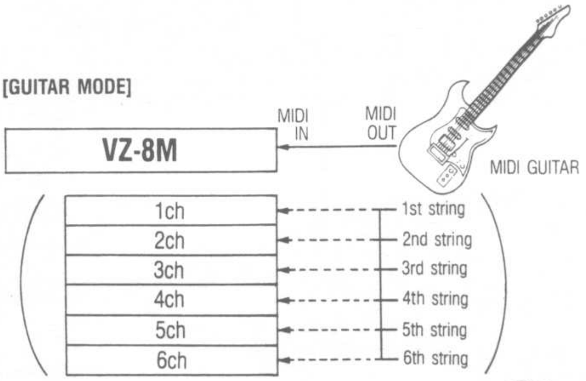
MIDI — Musical Instrument Digital Interface

This Digital Synthesizer module is equipped with MIDI — the Musical Instrument Digital Interface. To play using the module's sounds, you must connect the unit to other MIDI-equipped electronic musical instruments, drum, rhythm machines, sequencers or even personal computers through MIDI terminals.

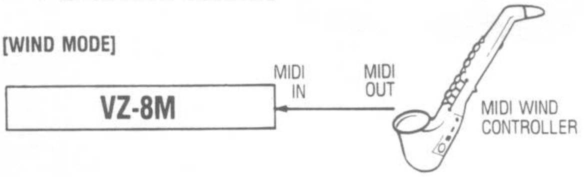
[KEYBOARD MODE]

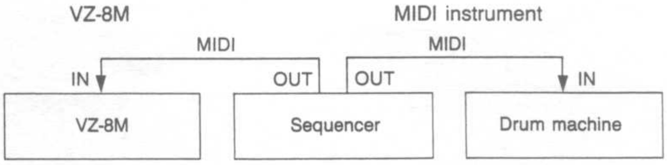

VZ-8M
MIDI IN
MIDI OUT
MIDI KEYBOARD

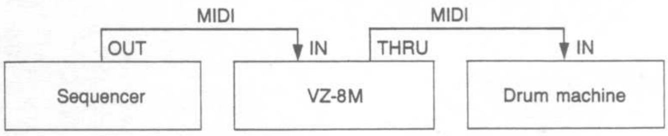
[GUITAR MODE]


VZ-8M
MIDI IN
MIDI OUT
MIDI GUITAR
1ch
2ch
3ch
4ch
5ch
6ch
1st string
2nd string
3rd string
4th string
5th string
6th string

[WIND MODE]


VZ-8M
MIDI IN
MIDI OUT
MIDI WIND CONTROLLER


VZ-8M
MIDI instrument
MIDI
MIDI
IN
OUT
OUT
IN
VZ-8M
Sequencer
Drum machine


MIDI
MIDI
OUT
IN
THRU
IN
Sequencer
VZ-8M
Drum machine

MIDI-related settings are made using the MIDI CHANNEL and MIDI DATA functions found in TOTAL-04, 05. For details on how to set MIDI-related parameters, refer to the corresponding function indexes.

STANDARD COMMUNICATION DATA

MODES MIDI MESSAGES	OP. MEM		NORMAL		COMBI		MUL. CH	
	SEND	RECEIVE	SEND	RECEIVE	SEND	RECEIVE	SEND	RECEIVE
Key pitch, Note ON/OFF, Velocity		○		○		○		○
After touch		○		○		○		○
Pitch bend		○		○		○		○
Definable wheel		○		○		○		○
Modulation wheel		○		○		○		○
Foot VR		○		○		○		○
Main volume		○		○		○		○
Portamento time		○		○		○		○
Portamento ON/OFF		○		○		○		○
Sustain pedal		○		○		○		○
Bend range		○		○		○		○
Program change (*1)		○		○		○		○
Mono mode (SOLO = ON)		○		○		○		○
Poly mode (SOLO = OFF)		○		○		○		○

*1: When PROG CHANGE = DIS is set in TOTAL-04, program change data is not transmitted/received.

SYSTEM EXCLUSIVE MESSAGES

MODES MIDI MESSAGES	OP. MEM		NORMAL		COMBI		MUL. CH	
	SEND	RECEIVE	SEND	RECEIVE	SEND	RECEIVE	SEND	RECEIVE
Single patch data (*1)			○	○				
Single operation data (*2)	○	○		○		○		○
Multi Channel data (*3)								○
SAVE/LOAD data	○	○	○	○	○	○	○	○
Master tune data		○		○		○		○
Key transpose data		○		○		○		○
Mode change data 1 (*4)		○		○		○		○
Mode change data 2 (*5)				○		○		
Shift change data (*6)		○		○		○		○
Bend range data		○		○		○		○

(*1) Single patch data sent when sound number is changed using VZ-8M controls in NORMAL PLAY MODE, or when SEND REQUEST MESSAGE is received.
Single operation data sent when operation number is changed using VZ-8M controls in OP MEM PLAY MODE, or when SEND REQUEST MESSAGE is received. In individual modes, operation data created in corresponding mode is received; when set to NORMAL MODE, operation data created in NORMAL MODE is received. When set to COMBI MODE, operation data created in COMBI MODE is received, etc.
Above data transmission/reception is impossible if TOTAL CONTROL "EXCLUSIVE" parameter (TOTAL-05) is disabled (set to DIS).

(*2) Transmission/reception is impossible if TOTAL CONTROL "EXCLUSIVE" parameter (TOTAL-05) is disabled (set to DIS).

(*3) Can only be executed in TOTAL CONTROL MODE. Transmission/reception is impossible if TOTAL CONTROL "EXCLUSIVE" parameter (TOTAL-05) is disabled (set to DIS).

(*4) MODE CHANGE-1 is used to switch between NORMAL, COMBI, MULTI CH, and OP MEM modes.

(*5) MODE CHANGE-2 is used to switch between K (Keyboard), G (Guitar), and W (Wind) performance modes.

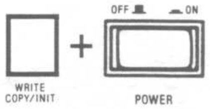
(*6) Transmission/reception is impossible if TOTAL CONTROL "PRG NO" parameter (TOTAL-05) is disabled (set to DIS).

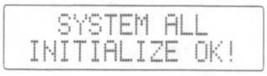
Initializing the VZ-8M

The VZ-8M can be "initialized" in a number of ways, allowing you to reset the entire unit to its initial factory settings or initialize only the data of a specific MODE or FUNCTION, for example. The following describes the various initializing procedures.

SYSTEM ALL INITIALIZE

To initialize **all** internal operation memory, voice and effect data to factory preset values, hold down the WRITE key and turn the unit power ON. All internal data is reset to its original state as listed on page 93.




SYSTEM ALL
INITIALIZE OK!

INITIALIZING VOICE menu FUNCTIONS

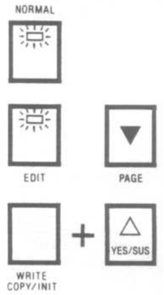
To initialize **all parameters** in any **single** VOICE menu function for a selected MODULE, simply press the EDIT key and the PAGE DOWN key and use the PAGE keys to select the desired function. Then hold down the WRITE (COPY/INITIALIZE) key and respond to the prompt by pressing the YES key.

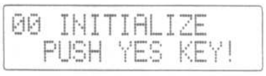
The values of all parameters in the selected function are then reset to their initialized state (see page 94). Parameter values in other functions, however, remain unaffected.

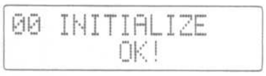
VOICE-00 LINE (M1M2-M7M8)
When this parameter is initialized, LINE DATA of all modules (M1-M8) are initialized automatically.

VOICE-09 ENVELOPE (DCA)
When this parameter is initialized, the data of not only VOICE-09 but AMP VEL RATE in VOICE-19 is automatically initialized.

VOICE-03 ENVELOPE (DCO)
When this parameter is initialized, the data of not only VOICE-03 but PITCH VEL RATE in VOICE-18 is automatically initialized.




00 INITIALIZE
PUSH YES KEY!

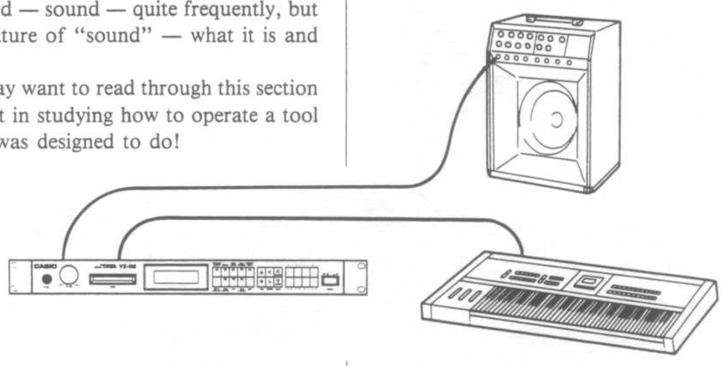

00 INITIALIZE
OK!

EFFECT MENU INITIALIZED DATA

PRESET 1 operation memories H-6 throgh H-8 contain initialized data for the EFFECT MENU NORMAL mode, COMBI MODE and MULTI CH mode, respectively. (See page 96~98.)

VZ Sound Seminar: The elements of sound synthesis

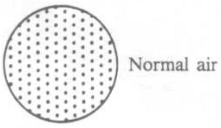
As a "sound synthesizer," your synth module is a device used to create "sounds". You probably use this word — sound — quite frequently, but did you ever actually think about nature of "sound" — what it is and how it is generated?
Before diving into operations, you may want to read through this section carefully — after all, there's no point in studying how to operate a tool without first understanding what it was designed to do!



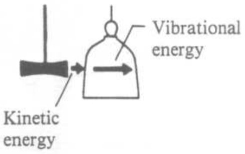
SOUND: A product of air?

Each day, we hear a great variety of sounds — music, human voices, raindrops — even our own footsteps. In other words, we live our lives literally surrounded by sound. Naturally, we can't see sound — so how can we describe it?
Technically speaking, sound is the sensation that we experience when movement or vibrations in the air are detected by our ears.
As a practical example, let's see how the "sound" of a bell is produced, and how it is sensed by our ears.

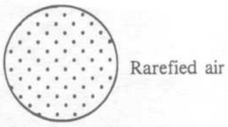
If we were to examine a mass of air where no sound is being carried, we would find that air particle density is relatively uniform. Naturally, there would be some movement of air particles, but there wouldn't be enough to generate an audible "sound". For this example, we will strike a bell with a hammer, in such a "sound-free" environment.



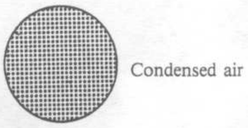
When kinetic (motive) energy is applied to a bell with a hammer, the bell surface is temporarily "deformed" — in other words, the shape of the bell structure is temporarily changed. Energy then goes to work to restore the bell to its original shape — this is called vibration. When the bell surface vibrates, two different — but interrelated — phenomena occur.



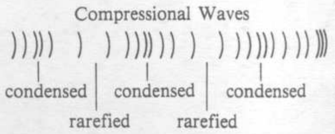
When the surface of the bell is "stretched in" (as bell is struck), random air particles surrounding the bell suddenly occupy a much larger air space than normal — in other words, the air suddenly becomes less dense immediately around the bell's surface. This is known as "**rarefaction.**" In simple terms, **rarefied** air is air with low atmospheric pressure, or less density than the surrounding air mass.



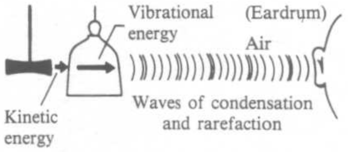
Immediately after the bell's surface is "stretched" by the hammer, the tension of the bell's surface causes it to spring outwards. This causes the same air particles which were just rarefied to become **compressed**. In simple terms, the air mass around the bell which was low in atmospheric pressure suddenly becomes high in atmospheric pressure.



The surface of the bell will then continue to oscillate back and forth until it settles back into its original shape.



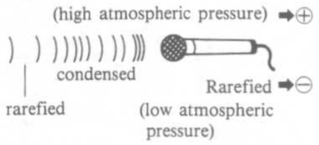
As you might imagine, the cyclical changes in air pressure caused by the oscillation of the bell's surface produced what are known as "**compressional waves.**" These waves of air pressure cause our eardrums to vibrate, and nerves in the inner ear translate these vibrations into "sound."



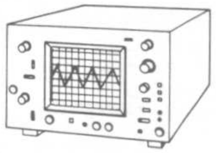
Naturally, the type of vibration produced is dependent on a great number of factors — as the vibrating body differs so will the vibrations, and so will the sound.

Seeing Sounds With Our Eyes: Waveforms

As we discussed in the introduction to this sound seminar, sounds cannot actually be seen with the human eye. However you've probably heard such expressions as "the waveform is different" "this is almost a pure sine wave," with regards to sound. But what exactly is meant by these terms — waveform and wave — and how can they be observed?



For a moment, let's consider the how a microphone works. As you probably already know, a microphone converts compressional waves into electrical signals, which can then be transmitted to an amplifier and speakers for output as sound. As shown in the illustration, these electrical signals are simple conversions of compressional waves — with condensed air being output as positive (+) electrical charges and rarefied air being output as negative (−) charges. The **compressional waves** of air are, then, transformed into electrical "waves", which can be viewed on electronic devices such as **oscilloscopes**. These waves are cyclical, and their form over time produces a visible shape or form which is called — you guessed it, a **waveform**.

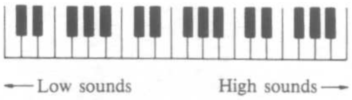

Oscilloscope

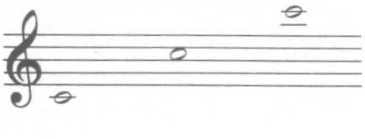
The Three Basic Elements of Sound

When we hear an individual sound, it can be defined by considering three different parameters; **Pitch**, **Timbre** and **Amplitude** (loudness).

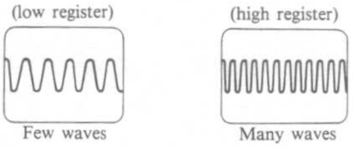
ELEMENT 1: PITCH

Pitch is the quality of a sound which makes it seem higher or lower than other sounds. For example, the notes at the top or right-hand end of a keyboard are "higher in pitch" than those at the left-hand end.
The pitch of a note is determined by the rate at which vibrations are set up in the air particles — i.e. the rate at which cyclical compression and rarefaction takes place.

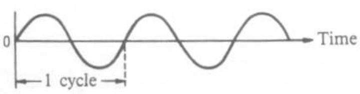




If we convert sounds into electrical signals and look at them on an oscilloscope, we can see that the number of waves per time unit differ between "high-pitched" and "low-pitched" sounds.

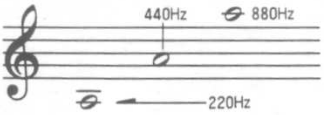


For a moment, let's go back to our bell example. As the bell produces compressions and rarefactions at a fixed rate, waves of particle vibrations are generated in the air surrounding the bell. These waves move away from the fork at a fixed rate — the speed of sound. As waves move away from our sound source (the bell) at a fixed rate, the length of each wave depends on the rate at which the bell's surface vibrates. A single cycle of a sine wave is shown on the right.



The distance that a wave covers in the time it takes to complete one cycle is known as the "**wavelength**," while the number of cycles that are made each second is known as the "**frequency**."

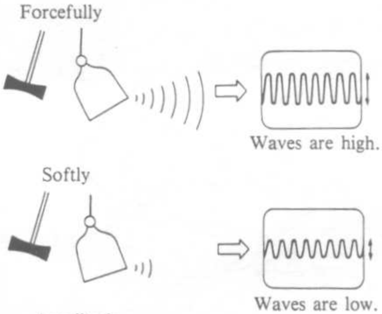
How does all this relate to pitch? Very simple — **the higher the frequency of a sound, the higher the pitch**. A low frequency sound will have a long waveform and a low pitch, while a high frequency sound will have a shorter waveform and a higher pitch. In the world of science (and music!), frequency is measured in units called "Hertz" (Hz). For example, 100Hz indicates that vibrations occur at the frequency of 100 times per second. Also, it's interesting to note that doubling the frequency of a sound will raise it by one octave.

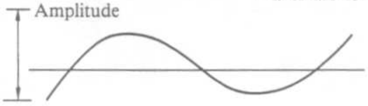


Well, that explains the length and speed of our "wave", but what about its height? Aha! The next element of sound — amplitude....

ELEMENT 2: Amplitude

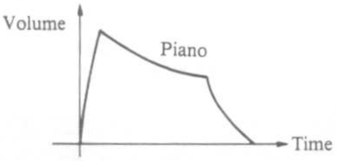
Compared with pitch, amplitude (loudness) is very easy to understand. If we consider the sine wave produced by our bell again, the harder the bell is hit by the hammer, the larger the bell vibrations and the more the air particles are compressed and rarefied. As a result, the peaks and troughs of the sound wave will be larger, and our ears will detect that the sound being produced is much louder. The vertical "height" of the wave, or the distance from the top of a peak to the bottom of a trough in a single cycle is known as **amplitude**. Simply speaking, we perceive amplitude as loudness — **the higher the amplitude, the louder the sound.**


Forcefully
Waves are high.
Softly
Waves are low.



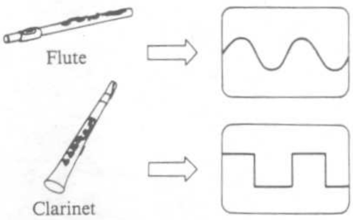
When we consider the loudness of a sound, the dynamics (changes in loudness) are a vital aspect. For example, listen to the sound produced by playing a single note on a piano. As the hammer strikes the strings (**attack**), the output of the piano rises from total silence to a maximum level almost instantly. The sound then starts to die away, or "**decay**", as the vibration of the strings is damped by the surrounding air. When you release the key, the piano dampers deaden the string vibration and the note dies away relatively quickly.

Note that all through this process, the loudness, or amplitude, has been changing. If we were to view these changes in volume over time graphically, we could see that amplitude takes a "shape" over time. This "shape" is known as the note's **amplitude envelope**.



But even if you play, for example, a flute and a clarinet at the exactly the same pitch and at exactly the same volume level, you won't hear the same sound.

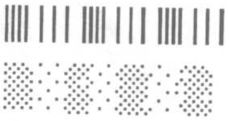
Which brings us to the third element of sound — **timbre**.



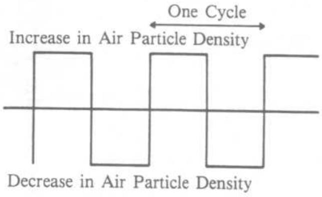
ELEMENT 3: Timbre

Timbre is the quality of a sound that enables us to distinguish the sound from another of the same pitch. If we look once again at the waveform produced by our bell, it's easy to see that the shape of the waveform is determined by the compressions and rarefactions of air produced by the bell's vibration.

Now look at the particles shown on the right.
As you can see, the source of the sound is such that the particles are compressed to a certain pressure for a fixed period of time and then rarefied for an equal period.

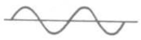
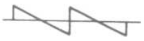
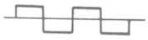


If we view this graphically, the resulting waveform is "square". This is, of course, what is known as a "square wave".


One Cycle
Increase in Air Particle Density
Decrease in Air Particle Density

Remember though, that the square wave still travels at the same speed as our sine wave, so, if it is of the same wavelength, our ears will interpret its pitch as being the same. But because the air particles are vibrating in a different way, we will hear the sound as an entirely different "**timbre**".

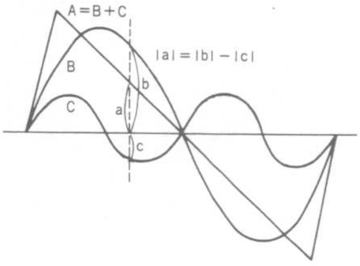
Very basically, we can divide waveforms into three types, shown below.

WAVEFORM	TYPE	TIMBRE	INSTRUMENTS
	Sine wave	Soft	Flute, whistle
	Saw-tooth wave	Bright	Violin, trumpet
	Square wave	Simple	Clarinet, oboe

The VZ-8M offers a total of 8 different waveforms. You'll become extremely familiar with the characteristics of each as you use the VZ-8M.

Fundamental Waves and Harmonics — Shaping the Timbre

Now that you have a basic idea of what sound is and how it is generated, you would probably like to know how you can determine the **shape of a wave** (=timbre) in order to create the kind of sound you want.
First, take a look at this diagram.



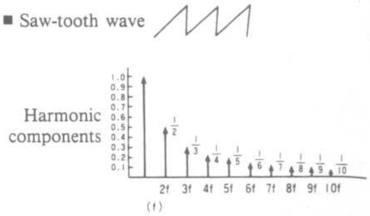
This figure illustrates the process of combining two sine waves in order to form a saw-tooth wave. B is the basic sine wave, while C is a wave which is oscillating at twice the frequency of B (making it one octave higher in pitch), and at only half the amplitude (volume) of B.

When we combine B and C, the result is waveform A. A is still not a perfect saw-tooth wave, but it will gradually approach a perfect saw-tooth shape as additional sine waves at 1/3, 1/4, 1/5, etc. the level of the fundamental wave are added.

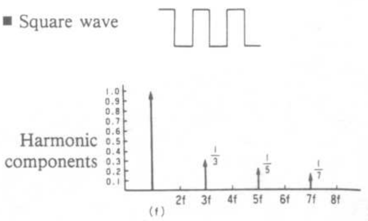
In this manner, any waveform can be created by adding a number of sine waves to a basic sine wave. Waves such as C with frequencies that are integral multiples of the frequency of the fundamental wave are known as "**harmonics**."

The waveform, and thus the timbre are actually determined by the kind of harmonics added to the basic sine wave. In simple terms, almost all sounds with their different timbres that reach our ears include a variety of different harmonics, and it is these harmonics which are responsible for the countless characteristic timbres.

■ Saw-tooth wave



■ Square wave



•Graphs such as the ones above which show the harmonic components of a wave form are called "harmonic spectrums".

ENVELOPES: Sound over time

The word "envelope" may be new to you — but it's an extremely important term in understanding sound, and especially important in sound synthesis.

Literally speaking, an "envelope" is a voltage that changes as a function of time. In the VZ-8M, envelopes are used to shape both the amplitude, pitch and timbre of a sound over time.

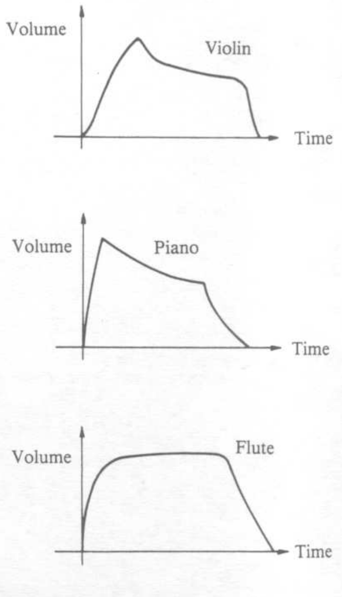
To understand envelopes more clearly, think of the sound of a violin. When the violinist bows a string, the volume, pitch and even timbre change slightly over time. If there were no changes over time, the sound would have no beginning, no pitch variance, and no end!

Think now of a piano. If a piano note were to sound continuously without decaying, it would be very difficult to distinguish it from the sound of a flute.

Envelopes, then, are what determine the overall "shape" of the sound over time — including the variations in pitch, volume and timbre.

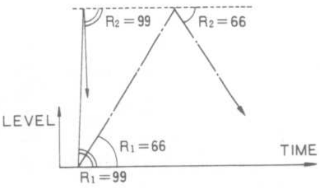
The VZ-8M lets you create envelope contours in up to 8 steps by making **RATE** and **LEVEL** specifications at up to 8 points in the envelope.

Envelope Curves of Various Instruments (Sound Volume)



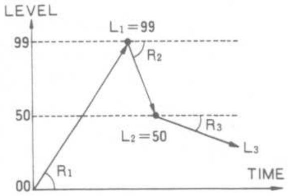
RATE

The RATE indicates the slope (interior angle in relation to horizontal axis) of each step in the envelope. A RATE value of "99" indicates a slope of nearly 90°, while a RATE value of "0" indicates nearly 0°. Since the value used is an absolute value, the slope increases and decreases in direct proportion with the RATE value, regarless of whether the pattern shows a rise or fall. This means that a steep incline results in a quick level change, while a gentle incline results in a slow level change.



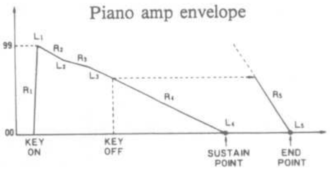
LEVEL

The LEVEL parameter indicates up to what point the envelope rises or falls at each step. For the DCO envelope, LEVEL means pitch height, while for the DCA envelope, LEVEL is equal to the amplitude (volume) level.



How RATEs and LEVELs Interact

To understand the relationship between RATEs and LEVEls, take a close look at a typical amplitude envelope shown on the right.


Piano amp envelope

Musical Sounds vs. Noise

Depending on the type of characteristic vibrations it is based on, a sound may be classified as being either "musical" or "noise". Sounds with regular cyclical vibrations (i.e. sound in which components other than harmonics are very few) are considered to be **musical**, while sounds caused by complicated irregular vibrations (i.e. sounds with many components that are not harmonics) whose pitch can therefore not be measured are classified as **noise**.

SYSTEM INITIALIZED DATA

	Mode	OPERATION MEMORY PST 1 A-1
	Internal	PST 1 64 PRESET TONES PST 2 64 OPERATION MEMORIES
	Compare/Recall	PST 1 voice A-1
WORKING AREA	Operation memory Normal Combination Multi-channel	PST 1 A-1 PST 2 operation memory H-6 see page 96 PST 2 operation memory H-7 see page 97 PST 2 operation memory H-8 see page 98
	Total control	00 MASTER TUNE = 0 (442Hz) 01 TRANSPOSE = C 02 MEMORY PROTECT INT = ON CARD = ON 03 SAVE/LOAD SAVE/LOAD = SAVE CARD/MIDI = CARD1 DATA = VC + OP 04 MIDI CHANNEL CHANNEL = 1 TOTAL = ON 05 MIDI DATA PROGRAM = 0-63 EXCLUSIVE = DIS DEF CONTROL = OFF VOLUME = ENA OVERFLOW = NORMAL

INITIALIZED VOICE PARAMETER MENU DATA

VOICE No.	—	VOICE NAME		OCTAVE	0	TOTAL LEV	99

	M1M2	M3M4	M5M6	M7M8		WAVE	DEPTH	RATE	DELAY	MULTI
INT LINE	MIX	MIX	MIX	MIX	VIBRATO	1	0	75	0	OFF
EXT PHASE		OFF	OFF	OFF	TREMOLO	1	0	75	0	OFF

	WAVE FORM	DETUNE		ENVELOPE/VEL RATE									ENV DEPTH		KEY FOLLOW							VELOCITY		AMP SENS
				STEP	1	2	3	4	5	6	7	8			POINT	1	2	3	4	5	6			
M1	1	FIX	OFF	RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY	C2	F4	C7	A7	E8	C9	SENS	0	0
		HARM	1	LEV	99	0	0	0	0	0	0	0												
		POL(×R)	+																					
		OCT	0	SS/ED	SS							ED	MOD ON/OFF	ON	LEV	99	99	99	99	99	99	CURVE	1	
		NOTE	0																					
		FINE	0	E/*	*	*	*	*	*	*	*	*												
M2	1	FIX	OFF	RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY	C2	F4	C7	A7	E8	C9	SENS	0	0
		HARM	1	LEV	99	0	0	0	0	0	0	0												
		POL(×R)	+																					
		OCT	0	SS/ED	SS							ED	MOD ON/OFF	ON	LEV	99	99	99	99	99	99	CURVE	1	
		NOTE	0																					
		FINE	0	E/*	*	*	*	*	*	*	*	*												
M3	1	FIX	OFF	RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY	C2	F4	C7	A7	E8	C9	SENS	0	0
		HARM	1	LEV	99	0	0	0	0	0	0	0												
		POL(×R)	+																					
		OCT	0	SS/ED	SS							ED	MOD ON/OFF	ON	LEV	99	99	99	99	99	99	CURVE	1	
		NOTE	0																					
		FINE	0	E/*	*	*	*	*	*	*	*	*												
M4	1	FIX	OFF	RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY	C2	F4	C7	A7	E8	C9	SENS	0	0
		HARM	1	LEV	99	0	0	0	0	0	0	0												
		POL(×R)	+																					
		OCT	0	SS/ED	SS							ED	MOD ON/OFF	ON	LEV	99	99	99	99	99	99	CURVE	1	
		NOTE	0																					
		FINE	0	E/*	*	*	*	*	*	*	*	*												
M5	1	FIX	OFF	RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY	C2	F4	C7	A7	E8	C9	SENS	0	0
		HARM	1	LEV	99	0	0	0	0	0	0	0												
		POL(×R)	+																					
		OCT	0	SS/ED	SS							ED	MOD ON/OFF	ON	LEV	99	99	99	99	99	99	CURVE	1	
		NOTE	0																					
		FINE	0	E/*	*	*	*	*	*	*	*	*												
M6	1	FIX	OFF	RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY	C2	F4	C7	A7	E8	C9	SENS	0	0
		HARM	1	LEV	99	0	0	0	0	0	0	0												
		POL(×R)	+																					
		OCT	0	SS/ED	SS							ED	MOD ON/OFF	ON	LEV	99	99	99	99	99	99	CURVE	1	
		NOTE	0																					
		FINE	0	E/*	*	*	*	*	*	*	*	*												
M7	1	FIX	OFF	RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY	C2	F4	C7	A7	E8	C9	SENS	0	0
		HARM	1	LEV	99	0	0	0	0	0	0	0												
		POL(×R)	+																					
		OCT	0	SS/ED	SS							ED	MOD ON/OFF	ON	LEV	99	99	99	99	99	99	CURVE	1	
		NOTE	0																					
		FINE	0	E/*	*	*	*	*	*	*	*	*												
M8	1	FIX	OFF	RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY	C2	F4	C7	A7	E8	C9	SENS	0	0
		HARM	1	LEV	99	0	0	0	0	0	0	0												
		POL(×R)	+																					
		OCT	0	SS/ED	SS							ED	MOD ON/OFF	ON	LEV	99	99	99	99	99	99	CURVE	1	
		NOTE	0																					
		FINE	0	E/*	*	*	*	*	*	*	*	*												
PITCH				RATE	50	50	50	50	50	50	50	50	RANGE	NARROW	KEY	C2	F4	C7	A7	E8	C9	SENS	0	
				LEV	0	0	0	0	0	0	0	0												
				SS/ED	SS							ED	DEPTH	63	LEV	63	63	63	63	63	63	CURVE	1	
				E/*	*	*	*	*	*	*	*	*												
PITCH /AMP															KEY	C2	F4	C7	A7	E8	C9	SENS	0	
															RATE	+0	+0	+0	+0	+0	+0	CURVE	1	

*With regards to INIT VOICE function (VOICE-21);

1. Only M1 is ON. M2～M8 are all OFF.
2. ENV DEPTH set to "99" for M1, and "85" for M2～M8.

VOICE No.		VOICE NAME		OCTAVE		TOTAL LEV	

	M1M2	M3M4	M5M6	M7M8
INT LINE				
EXT PHASE				

	WAVE	DEPTH	RATE	DELAY	MULTI
VIBRATO					
TREMOLO					

	WAVE FORM	DETUNE	
M1		FIX	
		HARM	
		POL(×R)	
		OCT	
		NOTE	
		FINE	
M2		FIX	
		HARM	
		POL(×R)	
		OCT	
		NOTE	
		FINE	
M3		FIX	
		HARM	
		POL(×R)	
		OCT	
		NOTE	
		FINE	
M4		FIX	
		HARM	
		POL(×R)	
		OCT	
		NOTE	
		FINE	
M5		FIX	
		HARM	
		POL(×R)	
		OCT	
		NOTE	
		FINE	
M6		FIX	
		HARM	
		POL(×R)	
		OCT	
		NOTE	
		FINE	
M7		FIX	
		HARM	
		POL(×R)	
		OCT	
		NOTE	
		FINE	
M8		FIX	
		HARM	
		POL(×R)	
		OCT	
		NOTE	
		FINE	

	ENVELOPE/VEL RATE									ENV DEPTH	
	STEP	1	2	3	4	5	6	7	8		
M1	RATE									DEPTH	
	LEV										
	SS/ED									MOD ON/OFF	
	E/＊										
M2	RATE									DEPTH	
	LEV										
	SS/ED									MOD ON/OFF	
	E/＊										
M3	RATE									DEPTH	
	LEV										
	SS/ED									MOD ON/OFF	
	E/＊										
M4	RATE									DEPTH	
	LEV										
	SS/ED									MOD ON/OFF	
	E/＊										
M5	RATE									DEPTH	
	LEV										
	SS/ED									MOD ON/OFF	
	E/＊										
M6	RATE									DEPTH	
	LEV										
	SS/ED									MOD ON/OFF	
	E/＊										
M7	RATE									DEPTH	
	LEV										
	SS/ED									MOD ON/OFF	
	E/＊										
M8	RATE									DEPTH	
	LEV										
	SS/ED									MOD ON/OFF	
	E/＊										
PITCH	RATE									RANGE	
	LEV										
	SS/ED									DEPTH	
	E/＊										

	KEY FOLLOW							VELOCITY		AMP SENS
	POINT	1	2	3	4	5	6			
M1	KEY							SENS		
	LEV							CURVE		
M2	KEY							SENS		
	LEV							CURVE		
M3	KEY							SENS		
	LEV							CURVE		
M4	KEY							SENS		
	LEV							CURVE		
M5	KEY							SENS		
	LEV							CURVE		
M6	KEY							SENS		
	LEV							CURVE		
M7	KEY							SENS		
	LEV							CURVE		
M8	KEY							SENS		
	LEV							CURVE		
PITCH	KEY							SENS		
	LEV							CURVE		
PITCH /AMP	KEY							SENS		
	RATE							CURVE		

EFFECT MENU INITIALIZED DATA

[NORMAL MODE] (OPERATION MEMORY PST 2 H-6)

OPERATION No.		**OPERATION NAME**	INIT NORMAL	**OPERATION TUNE**	+, 0, 0, 0

1	VOICE No.	PST 1 A-1	2	**VOICE No.**		3	**VOICE No.**		4	**VOICE No.**	
	NAME			**NAME**			**NAME**			**NAME**	
5	**VOICE No.**		6	**VOICE No.**		7	**VOICE No.**		8	**VOICE No.**	
	NAME			**NAME**			**NAME**			**NAME**	

MODE	NORMAL
K.G.W	K
KEY ASSIGN	

		1	2	3	4
MIDI CH		1			
PORTAMENTO/SOLO	PORTM ON/OFF	OFF			
	PORTM TIME	0			
	PORTM MODE	TIME CONST			
	SOLO	OFF			
	MONO/POLY	MONO			
PITCH BEND	BEND RANGE	2			
	RELEASE	ENA			
MOD WHEEL	SENSITIVITY	50			
	VIB DEPTH	OFF			
	VIB RATE	OFF			
	PITCH	OFF			
	PORTM TIME	OFF			
	TREM DEPTH	OFF			
	TREM RATE	OFF			
	A ENV BIAS	OFF			
DEF CONTROL	SENSITIVITY	50			
	VIB DEPTH	OFF			
	VIB RATE	OFF			
	PITCH	OFF			
	PORTM TIME	OFF			
	TREM DEPTH	OFF			
	TREM RATE	OFF			
	A ENV BIAS	OFF			
FOOT VR	SENSITIVITY	50			
	VIB DEPTH	OFF			
	VIB RATE	OFF			
	PITCH	OFF			
	PORTM TIME	OFF			
	TREM DEPTH	OFF			
	TREM RATE	OFF			
	A ENV BIAS	OFF			
FOOT SW	FOOT SW	SUS-TAIN			
VEL TABLE	VEL TABLE SEL	1			
VEL SPLIT	RANGE (FROM)				
	RANGE (TO)				
VEL INV	INVERSE				
DELAY TRIG	DELAY				

PAN	MODE	FIX
	PAN 1	0 (OFF)
	PAN 2	0 (OFF)
	CONTROL 1	MOD
	CONTROL 2	MOD
	RANGE 1	L→R
	RANGE 2	R→L
	RATE	20
	DEPTH	31
	CONTROL	OFF
SPLIT POINT	SP POINT	
	LOWER SP	
	MIDDLE SP	
	UPPER SP	
POS X-FADE	EFFECT	
	POS (FROM)	
	POS (TO)	
	L POS (FROM)	
	L POS (TO)	
	M POS (FROM)	
	M POS (TO)	
	U POS (FROM)	
	U POS (TO)	

Value with MODE set to AUTO in parentheses.

		1	2	3	4	5	6	7	8
AFTER TOUCH	SENSITIVITY	20							
	VIB DEPTH	OFF							
	VIB RATE	OFF							
	PITCH	OFF							
	PORTM TIME	OFF							
	TREM DEPTH	OFF							
	TREM RATE	OFF							
	A ENV BIAS	OFF							
LEVEL	LEVEL								
PITCH	POLARITY								
	OCTAVE								
	NOTE								
	FINE								
VIBRATO INV	INVERSE								
TREMOLO INV	INVERSE								

	ON/OFF	WAVE	DEPTH	RATE	DELAY	MULTI
TOTAL VIBRATO						
TOTAL TREMOLO						

EFFECT MENU INITIALIZED DATA

[COMBINATION MODE]

(OPERATION MEMORY PST 2 H-7)

OPERATION No.		**OPERATION NAME**	INIT COMBI	**OPERATION TUNE**	+, 0, 0, 0

1	VOICE No.	PST 1 A-1	2	**VOICE No.**	PST 1 B-1	3	**VOICE No.**	PST 1 C-1	4	**VOICE No.**	PST 1 D-1
	NAME			**NAME**			**NAME**			**NAME**	

5	**VOICE No.**	PST 1 E-1	6	**VOICE No.**	PST 1 F-1	7	**VOICE No.**	PST 1 G-1	8	**VOICE No.**	PST 1 H-1
	NAME			**NAME**			**NAME**			**NAME**	

MODE	COMBI
K.G.W	K
KEY ASSIGN	1+2

		1	2	3	4
MIDI CH		1			
PORTAMENTO/SOLO	PORTM ON/OFF	OFF	←	←	←
	PORTM TIME	0	←	←	←
	PORTM MODE	TIME CONST	←	←	←
	SOLO	OFF	←	←	←
	MONO/POLY	MONO			
PITCH BEND	BEND RANGE	2	←	←	←
	RELEASE	ENA	←	←	←
MOD WHEEL	SENSITIVITY	50	←	←	←
	VIB DEPTH	OFF	←	←	←
	VIB RATE	OFF	←	←	←
	PITCH	OFF	←	←	←
	PORTM TIME	OFF	←	←	←
	TREM DEPTH	OFF	←	←	←
	TREM RATE	OFF	←	←	←
	A ENV BIAS	OFF	←	←	←
DEF CONTROL	SENSITIVITY	50	←	←	←
	VIB DEPTH	OFF	←	←	←
	VIB RATE	OFF	←	←	←
	PITCH	OFF	←	←	←
	PORTM TIME	OFF	←	←	←
	TREM DEPTH	OFF	←	←	←
	TREM RATE	OFF	←	←	←
	A ENV BIAS	OFF	←	←	←
FOOT VR	SENSITIVITY	50	←	←	←
	VIB DEPTH	OFF	←	←	←
	VIB RATE	OFF	←	←	←
	PITCH	OFF	←	←	←
	PORTM TIME	OFF	←	←	←
	TREM DEPTH	OFF	←	←	←
	TREM RATE	OFF	←	←	←
	A ENV BIAS	OFF	←	←	←
FOOT SW	FOOT SW	SUS-TAIN	←	←	←
VEL TABLE	VEL TABLE SEL	1			
VEL SPLIT	RANGE (FROM)	1	←	←	←
	RANGE (TO)	127	←	←	←
VEL INV	INVERSE	OFF	←	←	←
DELAY TRIG	DELAY	0	←	←	←

PAN	MODE	FIX
	PAN 1	−15 (OFF)
	PAN 2	+15 (OFF)
	CONTROL 1	MOD
	CONTROL 2	MOD
	RANGE 1	L→R
	RANGE 2	R→L
	RATE	20
	DEPTH	31
	CONTROL	OFF
SPLIT POINT	SP POINT	B3
	LOWER SP	E3
	MIDDLE SP	A♭ 4
	UPPER SP	C6
POS X-FADE	EFFECT	OFF
	POS (FROM)	C3
	POS (TO)	F5
	L POS (FROM)	B♭ 2
	L POS (TO)	F♯ 3
	M POS (FROM)	C♯ 4
	M POS (TO)	A4
	U POS (FROM)	F5
	U POS (TO)	C♯ 6

Value with MODE set to AUTO in parentheses.

		1	2	3	4	5	6	7	8
AFTER TOUCH	SENSITIVITY	20	←	←	←	←	←	←	←
	VIB DEPTH	OFF	←	←	←	←	←	←	←
	VIB RATE	OFF	←	←	←	←	←	←	←
	PITCH	OFF	←	←	←	←	←	←	←
	PORTM TIME	OFF	←	←	←	←	←	←	←
	TREM DEPTH	OFF	←	←	←	←	←	←	←
	TREM RATE	OFF	←	←	←	←	←	←	←
	A ENV BIAS	OFF	←	←	←	←	←	←	←
LEVEL	LEVEL	99	←	←	←	←	←	←	←
PITCH	POLARITY	+	←	←	←	←	←	←	←
	OCTAVE	0	←	←	←	←	←	←	←
	NOTE	0	←	←	←	←	←	←	←
	FINE	0	←	←	←	←	←	←	←
VIBRATO INV	INVERSE	OFF	←	←	←	←	←	←	←
TREMOLO INV	INVERSE	OFF	←	←	←	←	←	←	←

	ON/OFF	WAVE	DEPTH	RATE	DELAY	MULTI
TOTAL VIBRATO	OFF	TRIANGLE	0	75	0	OFF
TOTAL TREMOLO	OFF	TRIANGLE	0	75	0	OFF

EFFECT MENU INITIALIZED DATA

[MULTI CH MODE]

(OPERATION MEMORY PST 2 H-8)

OPERATION No.	

OPERATION NAME	INIT MULTI

OPERATION TUNE	+, 0, 0, 0

MODE	MULTI

1	**VOICE No.**	PST 1 A-1	2	**VOICE No.**	PST 1 B-1
	NAME			**NAME**	
3	**VOICE No.**	PST 1 C-1	4	**VOICE No.**	PST 1 D-1
	NAME			**NAME**	
5	**VOICE No.**	PST 1 E-1	6	**VOICE No.**	PST 1 F-1
	NAME			**NAME**	
7	**VOICE No.**	PST 1 G-1	8	**VOICE No.**	PST 1 H-1
	NAME			**NAME**	

PAN	MODE	FIX
	PAN 1	0 (OFF)
	PAN 2	0 (OFF)
	CONTROL 1	MOD
	CONTROL 2	MOD
	RANGE 1	L→R
	RANGE 2	R→L
	RATE	20
	DEPTH	31
	CONTROL	OFF

Value with MODE set to AUTO in parentheses.

		1	2	3	4	5	6	7	8
NOTE — POLYPHONIC		8	0	0	0	0	0	0	0
MIDI CH		1	2	3	4	5	6	7	8
PORTAMENTO/ SOLO	PORTM ON/OFF	OFF	←	←	←	←	←	←	←
	PORTM TIME	0	←	←	←	←	←	←	←
	PORTM MODE	TIME CONST	←	←	←	←	←	←	←
	SOLO	OFF	←	←	←	←	←	←	←
PITCH BEND	BEND RANGE	2	←	←	←	←	←	←	←
	RELEASE	ENA	←	←	←	←	←	←	←
AFTER TOUCH	SENSITIVITY	20	←	←	←	←	←	←	←
	VIB DEPTH	OFF	←	←	←	←	←	←	←
	VIB RATE	OFF	←	←	←	←	←	←	←
	PITCH	OFF	←	←	←	←	←	←	←
	PORTM TIME	OFF	←	←	←	←	←	←	←
	TREM DEPTH	OFF	←	←	←	←	←	←	←
	TREM RATE	OFF	←	←	←	←	←	←	←
	A ENV BIAS	OFF	←	←	←	←	←	←	←
MOD WHEEL	SENSITIVITY	50	←	←	←	←	←	←	←
	VIB DEPTH	OFF	←	←	←	←	←	←	←
	VIB RATE	OFF	←	←	←	←	←	←	←
	PITCH	OFF	←	←	←	←	←	←	←
	PORTM TIME	OFF	←	←	←	←	←	←	←
	TREM DEPTH	OFF	←	←	←	←	←	←	←
	TREM RATE	OFF	←	←	←	←	←	←	←
	A ENV BIAS	OFF	←	←	←	←	←	←	←
DEF CONTROL	SENSITIVITY	50	←	←	←	←	←	←	←
	VIB DEPTH	OFF	←	←	←	←	←	←	←
	VIB RATE	OFF	←	←	←	←	←	←	←
	PITCH	OFF	←	←	←	←	←	←	←
	PORTM TIME	OFF	←	←	←	←	←	←	←
	TREM DEPTH	OFF	←	←	←	←	←	←	←
	TREM RATE	OFF	←	←	←	←	←	←	←
	A ENV BIAS	OFF	←	←	←	←	←	←	←
FOOT VR	SENSITIVITY	50	←	←	←	←	←	←	←
	VIB DEPTH	OFF	←	←	←	←	←	←	←
	VIB RATE	OFF	←	←	←	←	←	←	←
	PITCH	OFF	←	←	←	←	←	←	←
	PORTM TIME	OFF	←	←	←	←	←	←	←
	TREM DEPTH	OFF	←	←	←	←	←	←	←
	TREM RATE	OFF	←	←	←	←	←	←	←
	A ENV BIAS	OFF	←	←	←	←	←	←	←
FOOT SW	FOOT SW	SUS-TAIN	←	←	←	←	←	←	←
VEL TABLE	VEL TABLE SEL	1	←	←	←	←	←	←	←
LEVEL	LEVEL	99	←	←	←	←	←	←	←
PITCH	POLARITY	+	←	←	←	←	←	←	←
	OCTAVE	0	←	←	←	←	←	←	←
	NOTE	0	←	←	←	←	←	←	←
	FINE	0	←	←	←	←	←	←	←

[NORMAL/COMBINATION MODE]

OPERATION No.		**OPERATION NAME**		**OPERATION TUNE**	

1	**VOICE No.**		2	**VOICE No.**		3	**VOICE No.**		4	**VOICE No.**	
	NAME			**NAME**			**NAME**			**NAME**	

5	**VOICE No.**		6	**VOICE No.**		7	**VOICE No.**		8	**VOICE No.**	
	NAME			**NAME**			**NAME**			**NAME**	

MODE	
K.G.W	
KEY ASSIGN	

		1	2	3	4
MIDI CH					
PORTAMENTO/SOLO	PORTM ON/OFF				
	PORTM TIME				
	PORTM MODE				
	SOLO				
	MONO/POLY				
PITCH BEND	BEND RANGE				
	RELEASE				
MOD WHEEL	SENSITIVITY				
	VIB DEPTH				
	VIB RATE				
	PITCH				
	PORTM TIME				
	TREM DEPTH				
	TREM RATE				
	A ENV BIAS				
DEF CONTROL	SENSITIVITY				
	VIB DEPTH				
	VIB RATE				
	PITCH				
	PORTM TIME				
	TREM DEPTH				
	TREM RATE				
	A ENV BIAS				
FOOT VR	SENSITIVITY				
	VIB DEPTH				
	VIB RATE				
	PITCH				
	PORTM TIME				
	TREM DEPTH				
	TREM RATE				
	A ENV BIAS				
FOOT SW	FOOT SW				
VEL TABLE	VEL TABLE SEL				
VEL SPLIT	RANGE (FROM)				
	RANGE (TO)				
VEL INV	INVERSE				
DELAY TRIG	DELAY				

PAN	MODE	
	PAN 1	
	PAN 2	
	CONTROL 1	
	CONTROL 2	
	RANGE 1	
	RANGE 2	
	RATE	
	DEPTH	
	CONTROL	
SPLIT POINT	SP POINT	
	LOWER SP	
	MIDDLE SP	
	UPPER SP	
POS X-FADE	EFFECT	
	POS (FROM)	
	POS (TO)	
	L POS (FROM)	
	L POS (TO)	
	M POS (FROM)	
	M POS (TO)	
	U POS (FROM)	
	U POS (TO)	

		1	2	3	4	5	6	7	8
AFTER TOUCH	SENSITIVITY								
	VIB DEPTH								
	VIB RATE								
	PITCH								
	PORTM TIME								
	TREM DEPTH								
	TREM RATE								
	A ENV BIAS								
LEVEL	LEVEL								
PITCH	POLARITY								
	OCTAVE								
	NOTE								
	FINE								
VIBRATO INV	INVERSE								
TREMOLO INV	INVERSE								

	ON/OFF	WAVE	DEPTH	RATE	DELAY	MULTI
TOTAL VIBRATO						
TOTAL TREMOLO						

[MULTI CH MODE]

OPERATION No.	

OPERATION NAME	

OPERATION TUNE	

MODE	

1	**VOICE No.**		2	**VOICE No.**	
	NAME			**NAME**	

3	**VOICE No.**		4	**VOICE No.**	
	NAME			**NAME**	

5	**VOICE No.**		6	**VOICE No.**	
	NAME			**NAME**	

7	**VOICE No.**		8	**VOICE No.**	
	NAME			**NAME**	

PAN	MODE	
	PAN 1	
	PAN 2	
	CONTROL 1	
	CONTROL 2	
	RANGE 1	
	RANGE 2	
	RATE	
	DEPTH	
	CONTROL	

		1	2	3	4	5	6	7	8
NOTE — POLYPHONIC									
MIDI CH									
PORTAMENTO/ SOLO	PORTM ON/OFF								
	PORTM TIME								
	PORTM MODE								
	SOLO								
PITCH BEND	BEND RANGE								
	RELEASE								
AFTER TOUCH	SENSITIVITY								
	VIB DEPTH								
	VIB RATE								
	PITCH								
	PORTM TIME								
	TREM DEPTH								
	TREM RATE								
	A ENV BIAS								
MOD WHEEL	SENSITIVITY								
	VIB DEPTH								
	VIB RATE								
	PITCH								
	PORTM TIME								
	TREM DEPTH								
	TREM RATE								
	A ENV BIAS								
DEF CONTROL	SENSITIVITY								
	VIB DEPTH								
	VIB RATE								
	PITCH								
	PORTM TIME								
	TREM DEPTH								
	TREM RATE								
	A ENV BIAS								
FOOT VR	SENSITIVITY								
	VIB DEPTH								
	VIB RATE								
	PITCH								
	PORTM TIME								
	TREM DEPTH								
	TREM RATE								
	A ENV BIAS								
FOOT SW	FOOT SW								
VEL TABLE	VEL TABLE SEL								
LEVEL	LEVEL								
PITCH	POLARITY								
	OCTAVE								
	NOTE								
	FINE								

✱ = cool

OPERATION MEMORY NAMES

PRESET (1) (SAME AS INT)

	0 A	1 B	2 C	3 D	4 E	5 F	6 G	7 H
1	SEE GOD	BRASS CHORUS	SLAP BASS	HEAVY SPLIT	R/B BRASS	VZ EP	G.STEEL GTR	W.BRASS
2	SEE GOD 2	BRASS QUART	✱PICK BASS	STRING/FLUTE	CZ BRASS	VZ PIANO	G.VZ VIBES	W.SAX
3	VIB/STR SOFT	COPPERFUNK	FRETLESS BS	BASS/EP	ANALOG BRASS	VZ EP 2	G.LEAD	W.PAN FLUTE
4	ICE AGE	BRASS DETUNE	CC LEAD	BASS/VIBES	VELO ORCH	GITIANO	G.BASS-LEAD	W.OBOE
5	MELLOW PAD	VIOLINT ATCK	YES I GOT	BS/VBNO-SRNE	ORCHESTRA	CLAVI	G.ACO BASS	W.CLARINET
6	PEACE TREATY	DOUBLEGUITAR	VZ SOLO LEAD	VELOMONICA	HIGH STRINGS	WARM ORGAN	G.BS/TRUMPET	W.RECORDER
7	PIANO/LOCH	VZ VIBES	VZ PERC PAD	TRUMPOCITY	PAN VIBES	COOL ORGAN	G.BS/MONICA	W.SYNTH STR
8	DIGIVOICES	HEAVY METAL	TAKE A	HARP ROLL	TOI-TOY	BELL TREE	G.MULTI	W.POWER 5TH

PRESET (2)

	A	B	C	D	E	F	G	H
1	ICE HORNS	ACOUSTAR	FLANGE BASS	BS/GTNO-RICH	BEGINNING	WARM EP	G.JAZZ GTR	M.JAZZ BAND
2	VOCAL BELLS	TOY PIANO	SAXY LEAD	TXTURL SPL	SWIRLING STR	DYN VZ PIANO	G.WARM EP	M.FUNK BAND
3	TWINKY	DELAY VIBES	RING FLUTE	TXTURL SPL 2	HORN/STRINGS	DREAMY EP	G.DISTORTAR	M.ROCK BAND
4	FESTIVAL	OCTAVEMALLET	LIVE LEAD	EASTERN SPLT	VIB/PAN STR	DIGIPIANO	G.LEAD 2	M.CHAMBER
5	MELLIFLUENCE	STR QUARTET	VANUGENT 5TH	PASTOR/CLAVI	FESTIVAL 2	CLAVI PIANO	G.LEAD 3	M.NEW WAVE
6	FLUTE/STRING	STEREO BRASS	GAMELAN BELZ	VELOFLUTE	SOFT ORCHEST	ORGAN	G.EL BASS	INIT NORMAL
7	PEACEFUL	RECORDERS	OVERSEAS	SAXOPHOCITY	EP-SERENE	CHURCH ORGAN	G.BASS/SAX	INIT COMBI
8	GEN PURPOSE	PIPEONMONDAY	FEMALE VOICE	SOUND OF FUN	HEADBANGER	CAR HORN	G.MULTI GTR	INIT MULTI

*You can shift between PRESET banks (1) and (2) by pressing the SHIFT key once again.

About Operation Memory Preset Sounds

Each VZ operation memory has been programmed for use with a specific type of MIDI controller in mind. Normally, these OP MEMs are programmed for use with keyboard controllers — for example, PST 1 "A-6:PEACE TREATY" is designed for use with keyboards.

When OP MEMs are programmed for use with MIDI guitar or woodwind controllers, the performance mode is indicated in the first digit of the OP MEM name.

For example; [G-6:G.BS/TRUMPET]. In this case, the "G." indicates that the sound is best suited for use with a MIDI guitar controller. For woodwind controllers, a "W" appears as the first digit.

Also, when the sound has been programmed for multi-channel use, an "M" appears as the first digit.

OP MEM MIDI Guitar Applications

When an OP MEM is programmed for use with a MIDI guitar controller, MIDI CHANNELs 1 through 6 are assigned independently to each guitar string (MONO MODE). In addition, the bend range is set to 12. (In this case, the TOTAL parameter (TOTAL-04) must be set to OFF on the VZ-8M. If set to ON, the MIDI CH should be set to "1").

Woodwind Controllers

When using another manufacturer's woodwind controller or wind synthesizer, the controller should be set for aftertouch control. (Note that as OP MEMs programmed for use with wind controllers vary in volume and timbre through aftertouch control, some OP MEMs may not sound when played using a keyboard.)

VOICE NAMES

PRESET (1) (SAME AS INT)

	A	B	C	D	E	F	G	H
1	VZ EP	R/B BRASS	VZ TRUMPET	VZ BASS	FUSION LEAD	RICH ORCH	BRASS CHORUS	VZ VIBES
2	VZ PIANO	BRASSECTION	THE SAX	BASS GUITAR	DISTORTAR FB	SERENE ORCH	SYNBRASSES	VZ VIBES 2
3	VZ PIANO 2	RESO-BRASS	VZ-MONICA	FRETLESS BS	HEAVY LEAD	DIGIVOICE	BRASS BALLS	VIBIANO
4	VZ EP 2	MELLOW BRASS	FLUTE	60S BASS	VZ PERC PAD	SPACE ORCH	PRIMALSCREAM	TOI-TOY
5	VZ EP 3	VELO ORCH	STRINGATTACK	STEEL STRING	WHINING LEAD	FLUTE JUICE	VZ TOUCH	VZ MARIMBA
6	GITIANO	VZ STRINGS	WARM ORGAN	NYLON STRING	PIPE LEAD	CRYSTAL PAD	AVANALOCH	STEEL DRUM
7	CLAVI	ORCHESTRA	COOL ORGAN	HARP	SEQ BASS	ETHEREAL	CINEMA	BELLS
8	CLAVI 2	HORN/STRINGS	PIPE SYNTH	KOTO	BASS-SYNTH	NEW RAGE	CEREMONY	BELL TREE

PRESET (2)

	A	B	C	D	E	F	G	H
1	WARM EP	CZ BRASS	JAZZ SAX	ACOUSTAR	SYNTH FLUTE	PRETTY	GEN PURPOSE	SHARP VIBES
2	DYN VZ PIANO	ANALOG BRASS	JAZZ FLUTE	ACOUSTAR 2	FLUTISH LEAD	RICH ORCH 2	PLUCKED ATCK	VZ VIBES 3
3	VZ PIANO 3	BRASS LICKS	RECORDER	JAZZ GUITAR	SYNC LEAD	BELL/STRINGS	PLUCKED ATK2	* MELLOW VIBES
4	DREAMY EP	FUNK BRASS	VIOLIN	FUNK BASS	LIVE SYNTH	FESTIVAL	ANALOGUE	TOI PERCUSS
5	DIGIPIANO	HORN SWELL	CELLO	VZ BASS 2	DISTORTAR	PASTORALE	DIGIVOICE 2	COWBELL
6	COOL CLAVI	ORCHESTRA 2	ORGAN	DIRTY BASS	DISTORTAR 2	TUBIANO	MELLIFLUENCE	CHURCH BELL
7	HEAVY CLAVI	HIGH STRINGS	PIPE ORGAN	PIANO BASS	OBOE-FORMIDI	MIDEASTMARKT	CHORUS	GAMELAN BELL
8	CLAVI PIANO	SLOPHASESTR	CHURCH ORGAN	WOOD BASS	CLA-FOR MIDI	ETHNICBREATH	ABOVE CLOUD	CAR HORN

*You can shift between PRESET banks (1) and (2) by pressing the SHIFT key once again.

You can change the performance mode that is preset for any operation memory by using the following procedure:

1. Select the operation memory for which you wish to change the performance mode.
2. Hold down the WRITE key and press either the COMBINATION key or NORMAL key. Press the key (COMBINATION or NORMAL) whose indicator is lit.
3. Set the performance mode to K, G, or W using the cursor keys and VALUE keys.

* = COOL!

+ WRITES INTO INTERNAL MEMORY OF OPERATION + NORMAL AREA

OPERATION MEMORIES

•PRESET 1

A-1	**SEE GOD** Unique synthetic sound with a bell-like attack and thick sustain sound.
A-2	**SEE GOD 2** Another variation of the "SEE GOD" sound; slightly lighter than A-1. Sounds good when played legato.
A-3	**VIB/STR SOFT** Vibe sound on attack with sustained strings underneath; best suited to backing layers.
A-4	**ICE AGE** "Cool" crystalline sound changes to voice timbre with velocity.
A-5	**MELLOW PAD** Mellow, lazy sound; best suited to slower passages.
A-6	**PEACE TREATY** Tonic sound mixed with 5th. Note that one pitch of one sound changes with modulation.
A-7	**PIANO/LOCH** Mixed sound featuring electric piano and strings.
A-8	**DIGIVOICES** Spacial bell chorus sound which emulates female chorus.
B-1	**BRASS CHORUS** Cross-breed of brass and chorus sounds with a "classical" mood.
B-2	**BRASS QUART** Emulates brass quartet featuring sax and trumpet sounds.
B-3	**COPPERFUNK** Funky brass mix featuring 4 different sounds.
B-4	**BRASS DETUNE** Mixed brass sounds with second sound shifted to 5th. Pitch of one sound can be altered with modulation.
B-5	**VIOLINT ATCK** Violin sound with a sharp attack; sounds best when played percussively.
B-6	**DOUBLEGUITAR** Emulates acoustic guitar; panning localization changes with velocity.
B-7	**VZ VIBES** "Clear", crystal-like vibes sound. Delay trigger used to produce stereo effect.
B-8	**HEAVY METAL** Distortion guitar mixed sound with one sound shifted to 5th. Use aftertouch to bend down; sustain for "feedback".
C-1	**SLAP BASS** Heavy duty "slap" style electric bass. Play with percussive touch for best effect.
C-2	**PICK BASS** Emulates electric bass played with pick. Note that octave of one sound changes with modulation.
C-3	**FRETLESS BS** Smooth, fretless electric bass; aftertouch control of bend.
C-4	**CC LEAD** Thick lead sound with sharp, metallic attack.
C-5	**YES I GOT** Lead sound with electric piano attack. perfect for "fusion" sound. Aftertouch control of vibrato.
C-6	**VZ SOLO LEAD** Percussive lead sound. Aftertouch control of vibrato.
C-7	**VZ PERC PAD** Lead sound with sharp, metallic attack; lower end emulates "slap" style electric bass. Aftertouch control of vibrato.
C-8	**TAKE A** Tasty synth reed; aftertouch control of vibrato.
D-1	**HEAVY SPLIT** Split setup featuring distorted sound and heavy-duty, dirty bass. Split at F#3.
D-2	**STRING/FLUTE** Split setup featuring flute and strings. Note interesting flute attack sound. Split at F#4.
D-3	**BASS/EP** Split setup featuring electric piano and bass guitar. Aftertouch control of note bend for bass sound only. Split at C4.
D-4	**BASS/VIBES** Split setup featuring vibes and percussive bass timbre. Split at C4.
D-5	**BS/VBNO-SRNE** Split setup featuring percussive bass sound and a vibes/strings layered sound. Split at C4.
D-6	**VELOMONICA** Velocity split featuring VZ-MONICA and AVANALOCH patches. Aftertouch control of bending with VZ-MONICA patch; sustain pedal controls only AVANALOCH.
D-7	**TRUMPOCITY** Velocity split featuring VZ-TRUMPET and MELLOW BRASS patches. Aftertouch control of bending with VZ-TRUMPET patch; sustain pedal controls only MELLOW BRASS.
D-8	**HARP ROLL** Produce diminished chord arpeggio by holding down just one key!
E-1	**R/B BRASS** 〈Normal〉 Powerful brass sound. Modulation controls fast panning effect.
E-2	**CZ BRASS** 〈Normal〉 Synthesized brass with "wide" effect created through panning.
E-3	**ANALOG BRASS** 〈Normal〉 Analog style synth brass; modulation control of panning effect.
E-4	**VELO ORCH** 〈Normal〉 Orchestra sound with panning effect; timbral changes through velocity.
E-5	**ORCHESTRA** 〈Normal〉 Orchestra sound with panning effect; panning changes through modulation.

E-6 **HIGH STRINGS**
〈Normal〉 Synthetic strings with "width" added through panning effect.

E-7 **PAN VIBES**
〈Normal〉 Vibes sound made "wide" through panning.

E-8 **TOI-TOY**
〈Normal〉 Mix featuring percussive sound and sustained strings; modulation-controlled panning adds spacial effect.

F-1 **VZ EP**
〈Normal〉 Electric piano with addition of panning.

F-2 **VZ PIANO**
〈Normal〉 Gorgeous piano sound with modulation controlling panning effect.

F-3 **VZ EP 2**
〈Normal〉 Vibe-like electric piano sound with modulation control of panning.

F-4 **GITIANO**
〈Normal〉 Velocity split featuring gradual transition from electric piano to guitar sound; aftertouch control of bend.

F-5 **CLAVI**
〈Normal〉 Sharp clavi sound with modulation control of panning effect.

F-6 **WARM ORGAN**
〈Normal〉 Panning effect emulates electric organ rotating speaker sound.

F-7 **COOL ORGAN**
〈Normal〉 Similar to "F-6: WARM ORGAN" but with faster rotating speaker.

F-8 **BELL TREE**
〈Normal〉 "Moving" bell sound emulated through panning.

G-1 **G.STEEL GTR**
Steel guitar sound designed for use with MIDI guitar controller.

G-2 **G.VZ VIBES**
Vibes sound with panning effect; designed for use with MIDI guitar controller.

G-3 **G.LEAD**
Mix of twin synth lead sounds; designed for use with MIDI guitar controller.

G-4 **G.BASS LEAD**
Mixed sound featuring synth lead sound and electric bass in unison; designed for use with MIDI guitar controller. Independent panning of each string.

G-5 **G.ACO BASS**
Emulates twin acoustic bass sound; designed for use with MIDI guitar controller.

G-6 **G.BS/TRUMPET**
Designed for use with MIDI guitar controller; first four strings control trumpet sound with 5th and 6th strings controlling bass sound.

G-7 **G.BS/MONICA**
Designed for use with MIDI guitar controller; first four strings control harmonica timbre with 5th and 6th strings controlling bass timbre.

G-8 **G.MULTI**
Designed for use with MIDI guitar controller; Different sound for each string, including vibes, synth bass and bell timbres. Play all strings in a high-range chord for interesting effect.

H-1 **W.BRASS**
Designed for use with MIDI wind controller; features funky brass sound with sharp attack. Play percussively for best results.

H-2 **W.SAX**
Designed for use with MIDI wind controller; note the changes in sound with stronger attack.

H-3 **W.PAN FLUTE**
Designed for use with MIDI wind controller; pan flute sound. Note louder attack noise with stronger attack.

H-4 **W.OBOE**
Designed for use with MIDI wind controller; oboe-like synthetic sound is especially realistic from mid-range down.

H-5 **W.CLARINET**
Clarinet-like synth sound designed for use with MIDI wind controller.

H-6 **W.RECORDER**
"Woody" recorder sound designed for use with MIDI wind controller.

H-7 **W.SYNTH STR**
Synthesizer strings featuring panning effect for ambience; play harder for brighter strings sound. Designed for use with MIDI wind controller.

H-8 **W.POWER 5TH**
Thick 8-sound mix with 5th added; designed for use with MIDI wind controller.

•PRESET 2

A-1 **ICE HORNS**
Analog style synthetic sound emulates thick, bell-like timbre.

A-2 **VOCAL BELLS**
Mix of human voice and bells using velocity inverse; play softly for best results.

A-3 **TWINKY**
Synthethic timbre; note timbral changes when played staccato.

A-4 **FESTIVAL**
Interesting synthetic sound; useful when played as single notes or in unison.

A-5 **MELLIFLUENCE**
Mix of human voice and bells; useful in chords or in counter melodies.

A-6 **FLUTE/STRING**
Mix featuring flute sound and strings with a slow attack.

A-7 **PEACEFUL**
Metallic, percussive sound features timbral changes with alterations in velocity.

A-8 **GEN PURPOSE**
Multi-purpose percussive sound; good for leads, backing chords, etc.

B-1 **ACOUSTAR**
Acoustic guitar sound; useful when played in guitar arpeggios or in clavi-like "chops".

B-2 **TOY PIANO**
Huge "toy piano" sound; extremely realistic in mid and upper ranges.

B-3 **DELAY VIBES**
Vibe sound with short delay effect; nice for slower chord work.

B-4 **OCTAVEMALLET**
Percussive "mallet" sound in octave mix setup.

B-5 **STR QUARTET**
Lightweight string quartet; modulation adds vibrato.

B-6 **STEREO BRASS**
Interesting "stereo" setup featuring two different types of brass — one left, one right.

B-7 **RECORDERS**
Interesting recorder "ensemble".

B-8 **PIPEONMONDAY**
Slightly rough pipe organ sound; note changes from high range to lower range.

C-1 **FLANGE BASS**
Mixed arrangement featuring 4 different bass sounds and "flanger" effect.

C-2 **SAXY LEAD**
Sax-liek synth lead sound; aftertouch control of vibrato.

C-3 **RING FLUTE**
Flute-like synthetic sound with metallic attack noise.

C-4 **LIVE LEAD**
Heavy-duty synth lead sound; aftertouch control of heavy vibrato.

C-5 **VANUGENT 5TH**
Another heavy distortion lead sound with a 5th added; aftertouch control of bend.

C-6 **GAMELAN BELZ**
Emulates ethnic Indonesian "gamelan" bell-like sound; 4-sound mix.

C-7 **OVERSEAS**
4-sound ethnic mix with 5th added; play staccato for timbral variations.

C-8 **FEMALE VOICE**
Realistic, female vocal sound; note changes in attack sound with velocity.

D-1 **BS/GTNO-RICH**
Heavy-duty bass split featuring "GITIANO" and "RICH ORCH"; split at C4.

D-2 **TXTURL SPL**
Another interesting split setup featuring velocity-controlled brass and a percussive bass sound. Split at D4.

D-3 **TXTURL SPL 2**
Another split setup with a gorgeous synth sound and a heavy-duty bass sound. Split at D4.

D-4 **EASTERN SPLT**
Split setup with 2 different ethnic sounds; aftertouch control of bend. Split at D4.

D-5 **PASTOR/CLAVI**
Mix of PASTORALE and CLAVI sounds with timbral variations through velocity inverse function.

D-6 **VELOFLUTE**
Velocity split featuring synthetic sound and flute timbre.

D-7 **SAXOPHOCITY**
Velocity split featuring HORN SWELL and JAZZ SAX timbres. JAZZ SAX timbre feature aftertouch control of bend; sustain pedal controls HORN SWELL part only.

D-8 **SOUND OF FUN**
Play a single key for an automatic 4-note arpeggio (C, D, E, F,...); features bell-like sound.

E-1 **BEGINNING**
Huge ensemble sound emulates mixed sound featuring a number of different synth sounds. Modulation alters R/L assignment.

E-2 **SWIRLING STR**
Strings with slow attack; "swirling" effect through panning.

E-3 **HORN/STRINGS**
String-like sound with wide ambience through panning effect.

E-4 **VIB/PAN STR**
Mixed sound featuring vibes and strings with panning.

E-5 **FESTIVAL 2**
Synth ensemble featuring panning.

E-6 **SOFT ORCHEST**
Lightweight bells and strings; modulation controls panning effect.

E-7 **EP SERENE**
Mixed sound featuring electric piano sound and synth timbre with panning.

E-8 **HEADBANGER**
Distorted sound made "wider" through panning effect; second sound raised an octave through modulation.

F-1 **WARM EP**
⟨Normal⟩ Orthodox electric piano sound; modulation controls PAN effect.

F-2 **DYN VZ PIANO**
⟨Normal⟩ Standard electric piano with panning effect.

F-3 **DREAMY EP**
⟨Normal⟩ Dream-like electric piano sound with panning effect.

F-4 **DIGIPIANO**
⟨Normal⟩ Big electric piano sound; muse modulation for "thrilling" effect.

F-5 **CLAVI PIANO**
⟨Normal⟩ Clavi sound; sound moves from left to right each time a key is pressed.

F-6 **ORGAN**
⟨Normal⟩ Rockin' organ sound; modulation controls rotating speaker effect.

F-7 **CHURCH ORGAN**
⟨Normal⟩ Big church pipe organ; modulation controls panning effect.

F-8 **CAR HORN**
⟨Normal⟩ Realistic "European" auto horn; modulation changes panning localization.

G-1 **G.JAZZ GTR**
Designed for use with MIDI guitar controller; realistic jazz guitar with independent panning for each string.

G-2 **G.WARM EP**
Designed for use with MIDI guitar controller; vibes sound with panning effect.

G-3 **G.DISTORTAR**
Designed for use with MIDI guitar controller; mix featuring twin distortion guitar sounds.

G-4 **G.LEAD 2**
Designed for use with MIDI guitar controller; mixed sound featuring distorted synth lead sound with reverb.

G-5 **G.LEAD 3**
Designed for use with MIDI guitar controller; mix sound featuring twin lead synth guitars; play up to 4 notes for effective cutting.

G-6 **G.EL BASS**
Designed for use with MIDI guitar controller; mixed sound featuring twin electric bass sounds.

G-7 **G.BASS/SAX**
Designed for use with MIDI guitar controller; sax sound on strings 1 through 4, bass sound on strings 5 and 6.

G-8 **G.MULTI GTR**
Designed for use with MIDI guitar controller; slightly different acoustic guitar timbres on each string.

H-1 **M.JAZZ BAND**
Multi Channel setup; CH1:WOOD BASS/2-note poly; CH2:VZ EP/4-note poly; CH3:THE SAX/3-note poly.

H-2 **M.FUNK BAND**
Multi Channel setup; CH1:VZ BASS/2-note poly; CH2:GITIANO/3-note poly; CH3:R/B BRASS/3-note poly.

H-3 **M.ROCK BAND**
Multi Channel setup; CH1:PIANO BASS/2-note poly; CH2:ORGAN/3-note poly; CH3:DISTORTER/3-note poly.

H-4 **M.CHAMBER**
Multi Channel setup; CH1:CELLO/2-note poly; CH2:BRASS CHORUS/2-note poly; CH3:VIOLIN/2-note poly; CH4:FLUTE/2-note poly.

H-5 **M.NEW WAVE**
Multi Channel setup; CH1:SEQ BASS/2-note poly; CH2:DIGI VOICE/4-note poly; CH3:VZ MARIMBA/2-note poly.

H-6 **INIT NORMAL**
Features initialized data for NORMAL mode.

H-7 **INIT COMBI**
Features initialized data for COMBI mode.

H-8 **INIT MULTI**
Features initialized data for MULTI CHANNEL mode.

Care of Your Unit

1. Avoid heat, humidity and direct sunlight.

Do not overexpose your unit to direct sunlight, place it near a heater, or in any area are subject to high temperatures.

2. Severe impact can result in malfunction.

This digital synthesizer is composed of precision electronic components which can be damaged when subjected to severe impacts. Be sure to pack it carefully when transporting, using a case whenever possible.

3. Avoid direct contact with liquids, dirt, dust, etc.

Never allow foreign matter to enter this product. Also, be especially careful of metallic objects such as hairpins, sewing needles or coins. Do not allow the unit to get wet.

4. Never attempt to modify any part of the unit.

Any modification of, or tampering with the unit internal components can cause trouble or malfunction. If your unit is not operating properly, be sure to take it to an authorized Casio service center.

5. Do not use caustic cleaning agents.

Clean your unit with a soft cloth dampened with a mild detergent solution. Use of thinner, alcohol, benzene and similar chemicals should be avoided under all circumstances.

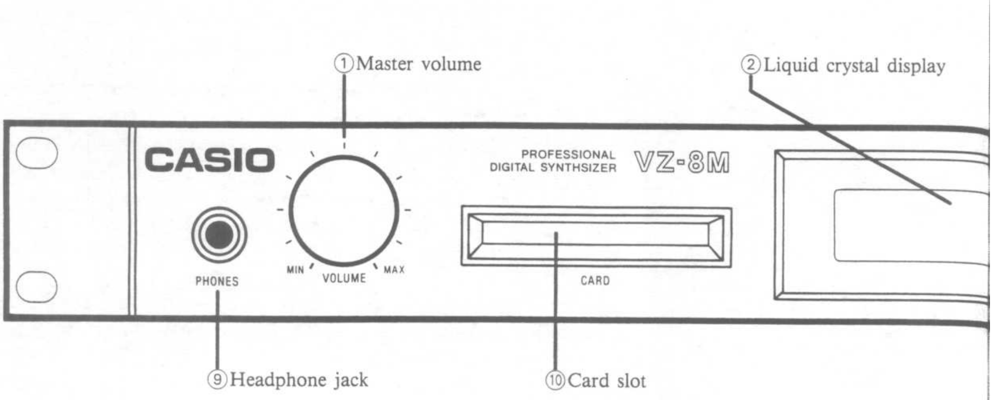
6. Avoid using this unit near televisions, radios, etc.

Because this unit uses digital circuitry, it may cause interference with other electronic devices such as televisions, radios, etc.

Care of Your Optional ROM or RAM Card

1. Take care not to bend or drop your memory cards. Never carry a card in your back pocket or leave it in other areas where it may be damaged.
2. When not in use, be sure to store your card in its custom case to prevent damage due to dust etc.
3. Your card contains precision electronic components. Never try to take it apart for any reason.
4. Casio claims no responsibility whatsoever for damages due to losses of card data.

Features and Functions


①Master volume
②Liquid crystal display
CASIO
PROFESSIONAL DIGITAL SYNTHSIZER
VZ-8M
MIN
VOLUME
MAX
PHONES
CARD
⑨Headphone jack
⑩Card slot

①Master volume
Used to adjust the overall output volume.

②Liquid crystal display
Backlit liquid crystal graphic display is used to display all menu functions.

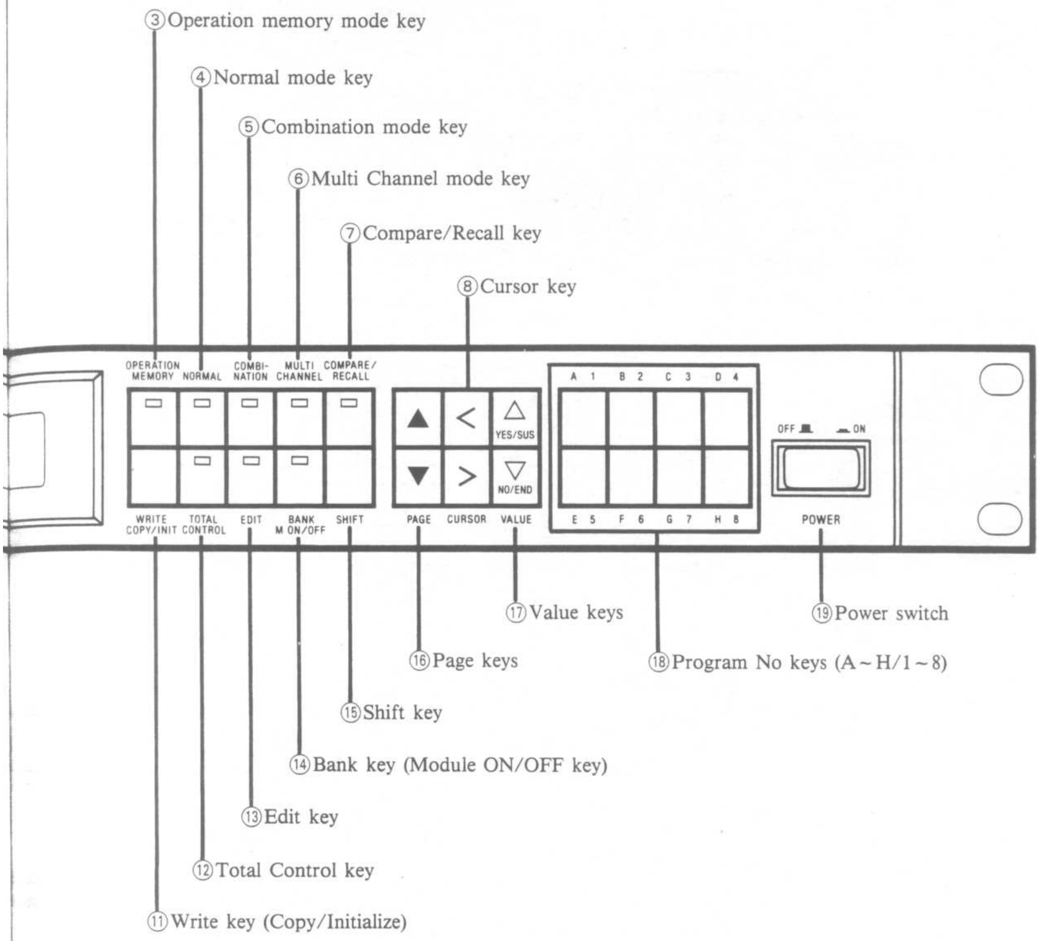
③Operation memory mode key
Used to select the OPERATION MEMORY operational mode.

④Normal mode key
Used to select the NORMAL operational mode.

⑤Combination mode key
Used to select the COMBINATION operational mode.

⑥Multi Channel mode key
Used to select the MULTI CHANNEL operational mode.

⑦Compare/Recall key
Used during editing to "recall" the original sound (sound before editing) and "compare" it with the edited version. When the indicator is OFF, the original sound is output. When the indicator is ON, the edited version is output.


③Operation memory mode key
④Normal mode key
⑤Combination mode key
⑥Multi Channel mode key
⑦Compare/Recall key
⑧Cursor key
OPERATION MEMORY
NORMAL
COMBI-NATION
MULTI CHANNEL
COMPARE/ RECALL
YES/SUS
NO/END
A 1
B 2
C 3
D 4
E 5
F 6
G 7
H 8
OFF
ON
WRITE COPY/INIT
TOTAL CONTROL
EDIT
BANK M ON/OFF
SHIFT
PAGE
CURSOR
VALUE
POWER
⑰Value keys
⑲Power switch
⑯Page keys
⑱Program No keys (A~H/1~8)
⑮Shift key
⑭Bank key (Module ON/OFF key)
⑬Edit key
⑫Total Control key
⑪Write key (Copy/Initialize)

⑧Cursor key

Used to move the "cursor" within the various menu functions.

⑨Headphone jack

Connect headphones for "private" performance.

⑩Card slot

Insert ROM or RAM cards for save/load of sound data. With a ROM card, up to 128 individual patches and 128 operation memories can be stored. RAM cards allow storage of up to 64 patches and 64 operation memories.

⑪Write key (Copy/Initialize)

Used to write edited sounds to either internal, card or operational memories.

⑫Total Control key

Used to access the TOTAL CONTROL editing menu.

⑬Edit key

Used to access the VOICE PARAMETER and EFFECT editing menus.

⑭Bank key (Module ON/OFF key)
Used to begin bank selection process. After pressing this key, you can select BANKs A through H using the PROG NO keys. This key is also used to turn iPD sound source modules ON and OFF when editing sounds using VOICE PARAMETER menu functions.

⑮Shift key
Used to select the memory area (PRESET 1 or 2, INTERNAL, CARD 1 or 2).

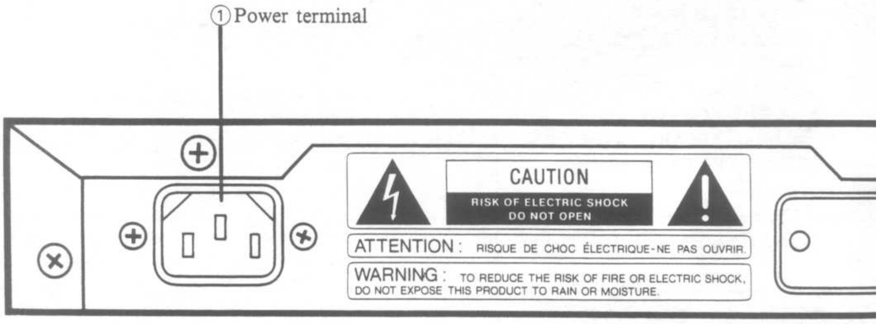
⑯Page keys
Used when accessing various editing functions. The PAGE [▲] key increments function numbers, while the PAGE [▼] key decrements these numbers.

⑰Value keys
Used to raise or lower values of various VZ-8M parameters.

⑱Program No keys (A ~ H/1 ~ 8)
The Program Number keys are used to select iPD sound source modules (M1 ~ M8), and also to specify the sound bank (A ~ H) as well as sound number (1 ~ 8).

⑲Power switch
Switches unit ON and OFF.

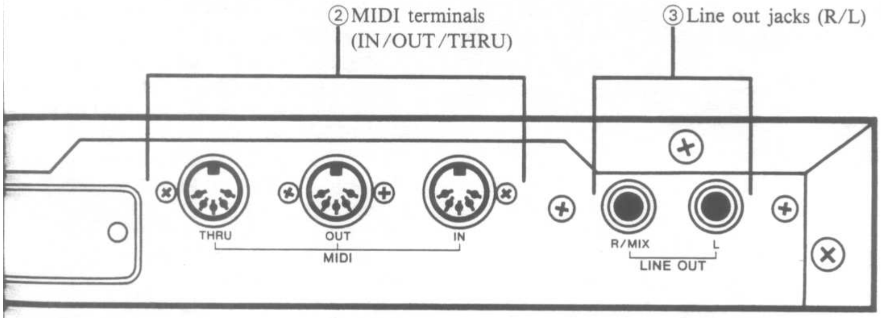
REAR PANEL CONNECTIONS


①Power terminal
CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
ATTENTION : RISQUE DE CHOC ÉLECTRIQUE-NE PAS OUVRIR.
WARNING : TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

①Power terminal
For connection of accessory AC power cord

②MIDI terminals (IN/OUT/THRU)
For connection of other MIDI-equipped instruments and devices.

③Line out jacks (R/L)
In the Combination mode or Multi-Channel mode, up to 4 patches or up to 8 areas are separated and assigned automatically into Line Out R or Line Out L. Mixed (mono) sound is output through the "R" jack.


②MIDI terminals (IN/OUT/THRU)
③Line out jacks (R/L)
THRU
OUT
IN
MIDI
R/MIX
L
LINE OUT

Specifications

Model:	VZ-8M
Range:	F#-1 ~ G9 (MIDI NOTE No. 6 ~ 127(10))
Polyphonic:	8 note-polyphonic
Sound source:	iPD (interactive phase distortion) SYSTEM
Modes:	NORMAL K (keyboard), NORMAL G (guitar), NORMAL W (wind instrument), COMBINATION K, COMBINATION G, COMBINATION W, OPERATION MEMORY, MULTI CHANNEL
Programmer:	128 preset voices, 64 internal voices, 128 card voices (with ROM card), 64 card voices (with RAM card RA-500), 1 compare/recall voice, 128 preset operation memory, 64 internal operation memory, 128 card operation memory (with ROM card), 64 card operation memory (with RAM card RA-500)
Modules:	8 × (DCO + DCA), ON/OFF
Voice parameters:	INT LINE (MIX/RING/PHASE), EXT PHASE(ON/OFF), WAVE FORM: 8, DETUNE (PITCH FIX, RANGE, HARMONIC, TUNE) < DCO > ENVELOPE(STEP = 1 ~ 8, RATE = 0 ~ 99, LEVEL = − 63 ~ + 63, SUS, END), ENV DEPTH (RANGE = WIDE/NARROW, DEPTH = 0 ~ 63), KF LEVEL (POINT = 1 ~ 6, KEY = C0 ~ C9, LEVEL = 0 ~ 63), VEL LEVEL (SENS = 0 ~ 31, CURVE = 1 ~ 8), VIBRATO (WAVE: 4, DEPTH = 0 ~ 99, RATE = 0 ~ 99, DELAY = 0 ~ 99, MULTI = ON/OFF), OCTAVE (− 2 ~ + 2) < DCA > ENVELOPE (STEP = 1 ~ 8, RATE = 0 ~ 99, LEVEL = 0 ~ 99, SUS, END), ENV DEPTH (0 ~ 99), KF LEVEL (POINT = 1 ~ 6, KEY = C0 ~ C9, LEVEL = 0 ~ 99), VEL LEVEL (SENS = 0 ~ 31, CURVE = 1 ~ 8), TREMOLO(WAVE: 4, DEPTH = 0 ~ 99, RATE = 0 ~ 99, DELAY = 0 ~ 99, MULTI = ON/OFF), AMP SENS (0 ~ 7), TOTAL LEVEL (0 ~ 99) < DCO/DCA > KF RATE (POINT = 1 ~ 6, KEY = C0 ~ C9, RATE = 0 ~ 99), VEL RATE (SENS = 0 ~ 31, CURVE = 1 ~ 8), P VEL RATE (ENA/DIS), A VEL RATE (ENA/DIS), VOICE NAME, INIT VOICE
Effect parameters:	MIDI CHANNEL (1 ~ 16), PORTAMENTO/SOLO(PORTM = ON/OFF, PORTM TIME = 0 ~ 99, PORTM MODE = TIME CONST/RATE CONST, SOLO = ON/OFF, POLY/MONO), PITCH BEND(RANGE = 0 ~ 48, RELEASE = ENA/DIS), AFTER TOUCH/MOD WHEEL/DEF CONTROL/FOOT VR (SENS = 0 ~ 99, − 99 ~ + 99, VIB DEPTH = ON/OFF, VIB RATE = ON/OFF, PITCH = + ON/ − ON/OFF, PORTM TIME = ON/OFF, TREM DEPTH = ON/OFF, TREM RATE = ON/OFF, A ENV BIAS = ON/OFF), FOOT SW (SUSTAIN/SOSTENUTO/DISABLE), VEL TABLE SELECT (TABLE NO. = 1 ~ 8), PAN(MODE = FIX/CONTROL/AUTO, FIX: PANPOT1/2 = − 15 ~ 0 ~ + 15, CONTROL: CONTROL1/2 = AFTER/FOOT VR/MOD/DEF/PAN, RANGE1/2 = L/R/C ~ L/R/C, AUTO:PAN1/2 = ON/OFF, RATE = 0 ~ 63, DEPTH = 0 ~ 31, CONTROL = AFTER/FOOT VR/MOD/DEF/OFF), LEVEL (0 ~ 99), PITCH (POLARITY = + / − , OCTAVE = 0 ~ 5, NOTE = 0 ~ 11, FINE = 0 ~ 63), SPLIT POINT (C0 ~ C9), VEL SPLIT (RANGE = 1 ~ 127), VEL INVERSE (ON/OFF), POS CROSSFADE (X-FADE = ON/OFF, POS = C0 ~ C9), DELAY TRIGGER (0 ~ 99), TOTAL VIBRATO (ON/OFF), VIBRATO INVERSE (ON/OFF), TOTAL TREMOLO (ON/OFF), TREMOLO INVERSE (ON/OFF), COMBI COPY (1 ~ 8), OPERATION NAME, OPERATION TUNE

Total control parameters:	MASTER TUNE (−64~+64), TRANSPOSE (G~F#), MEMORY PROTECT (INTERNAL=ON/OFF, CARD=ON/OFF), SAVE/LOAD (SAVE/LOAD, CARD1/CARD2/MIDI, DATA=VOICE/OPMEM/VC+OP/FULL), MIDI CHANNEL (CHANNEL=1~16, TOTAL=ON/OFF), MIDI DATA (PROGRAM=0~127/0~63/DIS, EXCLUSIVE=ENA/DIS, DEF CONTROL=OFF/12~31, VOLUME=ENA/DIS, OVERFLOW=NORMAL/1~8, CARD FORMAT
Input/output:	line out × 2 (MIX/R, L) Output impedence: 2.2kΩ
Output voltage:	1.3V (RMS) MAX, headphones, MIDI (IN/OUT/THRU), card slot
Display:	16 characters × 2 (with back-up light)
Power supply:	AC 100V, 120V, 220V, 240V using supplied AC cord
Memory back up:	Built-in lithium battery (life: approx. 5 years)
Power consumption:	13W
Dimensions:	482.6 × 300 × 53.6mm (19'' × 11$\frac{13}{16}$'' × 2$\frac{1}{8}$'')
Weight:	4.0kg (8.8lbs)
Standard accessories:	AC power cord, plug cord set, MIDI cable (3m), Menu table

**Design and specifications are subject to change without notice.*

GUIDELINES LAID DOWN BY FCC RULES FOR USE OF THE UNIT IN THE U.S.A. (not applicable to other areas).

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

..... reorient the receiving antenna
..... relocate the equipment with respect to the receiver
..... move the equipment away from the receiver
..... plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the US Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

WARNING:

CHANGING THE VOLTAGE SELECTOR MAY REQUIRE THE USE OF A DIFFERENT LINE CORD OR ATTACHMENT PLUG, OR BOTH. TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

IMPORTANT SAFETY INSTRUCTIONS

"INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS"

WARNING — When using electric products, basic precautions should always be followed, including the following:

1. Read all the instructions before using the product.

2. Do not use this product near water - for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.

3. This product should be used only with a stand that is recommended by the manufacturer.

4. This product, either alone or in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.

5. The product should be located so that its location or position does not interfere with its proper ventilation.

6. The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat.

7. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.

8. This product may be equipped with a polarized line plug. This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician to replace your obsolete outlet. Do not defeat the safety purpose of the plug.

9. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time.

10. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

11. The product should be serviced by qualified service personnel when:

   A. The power-supply cord or the plug has been damaged; or

   B. Objects have fallen, or liquid has been spilled into the product; or

   C. The product has been exposed to rain; or

   D. The product does not appear to operate normally or exhibits a marked change in performance; or

   E. The product has been dropped, or the enclosure damaged.

12. Do not attempt to service the product beyond that described in the user-maintenance instructions. All other servicing should be referred to qualified service personnel.

SAVE THESE INSTRUCTIONS

GROUNDING INSTRUCTIONS

This product must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER — Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or serviceman if you are in doubt as to whether the product is properly grounded. Do not modify the plug provided with the product — if it will not fit the outlet, have a proper outlet installed by a qualified electrician.